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IMPROVING WOMEN'S HEALTH THROUGH BIOMEDICAL AND BEHAVIORAL RESEARCH

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DEPOSITORY

HEARING

OF THE

PAPPAS LAW LIBRARY

COMMITTEE ON LABOR AND HUMAN RESOURCES UNITED STATES SENATE ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

EXAMINING CRITICAL ISSUES OF EMPLOYMENT IN TERMS OF OVERALL HEALTH POLICY ISSUES, BUT TO RECOGNIZE THE SINGULAR OPPORTUNITY THAT EXISTS TODAY IN THE AREAS OF RESEARCH AND ALSO TO FURTHER IDENTIFY FOR THE NATIONAL CONSCIOUSNESS AREAS AND GAPS WHICH HAVE EXISTED IN THE DEVELOPMENT OF BASIC RESEARCH AND CLINICAL RESEARCH INVOLVING WOMEN IN OUR SOCIETY

JANUARY 11, 1993 (BOSTON, MA)

Printed for the use of the Committee on Labor and Human Resources



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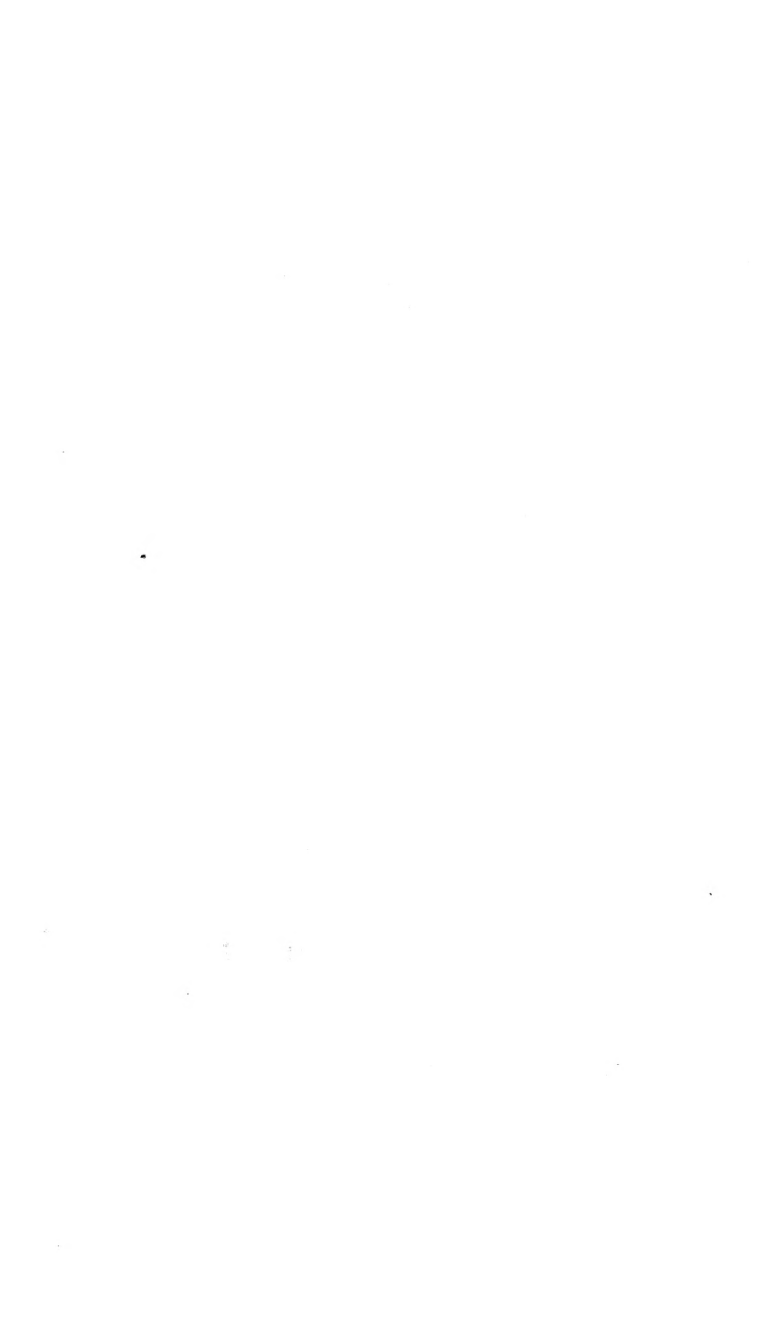
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IMPROVING WOMEN'S HEALTH THROUGH BIOMEDICAL AND BEHAVIORAL RESEARCH

MONDAY, JANUARY 11, 1993

U.S. SENATE,
COMMITTEE ON LABOR AND HUMAN RESOURCES,
Boston, MA.

The committee met, pursuant to notice, at 10:00 a.m., in the Hiebert Lounge, Boston University School of Medicine, Boston, MA, Senator Edward M. Kennedy (chairman of the committee) presiding.

Present: Senator Kennedy.

Dr. CHOBANIAN. Senator Kennedy, Mrs. Kennedy, Dr. Healy, Dr. Silber, Commissioner Kurland, Dr. Van Dunn, board members of our institutions, faculty, special guests, staff, and friends, on behalf of the BU medical campus and its component institutions—the School of Medicine, Boston University Medical Center Hospital, Boston City Hospital, the Goldman School of Graduate Dentistry—I am pleased to welcome you to these field hearings of the U.S. Senate Committee on Labor and Human Resources.

We are particularly pleased to welcome Senator Kennedy, our outstanding and distinguished Senator, who has been a strong supporter of biomedical research. A special welcome also goes out to Dr. Bernadine Healy, who has been a remarkably effective leader of the NIH and who has advanced many important women's health research initiatives during her tenure.

At this medical campus, we have had a long-term interest in women's health and in clinical and research programs related to it. These have included programs in heart disease, cancer, osteoporosis, women's health, family violence, and for example, the Framingham Heart Study was one of the first epidemiologic studies in the country to include women in a study population and to follow them for many years.

I would like at this point to introduce President John Silber, who will bring introductory welcoming remarks from the university.

Dr. Silber.

Mr. SILBER. We are honored at Boston University to be the location of this hearing of the Senate Committee, and we want to thank Senator Kennedy for coming here for his presentation. And we want to also welcome Dr. Healy. Her concerns have very much been the concerns of Boston University.

As many of you know, Boston University School of Medicine merged with the Women's Medical College some years ago on its founding, and we have admitted women and taught women as physicians from the very start. Under the charter of Boston University,

adopted in 1869, the university was by that charter committed to opening all divisions of the university to women no less than men and also to discriminate on no basis of sex or religion or ethnicity. And consequently, in this medical school, we have not only graduated the first women physicians, but the first black physician, the first black psychiatrist, and in our law school, we educated the first female judge in Massachusetts, and we have had many firsts in medical education simply because we were integrated in terms of sex from the very founding of the university itself and its chartering.

Our commitment to this research in areas of particular concern to women will of course be made clearer by the professionals who will testify, but there is another area that will not be on the program today, and that is the research of Dr. Jack Murphy of our School of Medicine, which has led to the discovery and patenting of the fusion toxin technology now being developed under a company that was sponsored by Boston University, Seragen. Among the products they are developing is one in which there is the fusion of diphtheria toxin with the EGF, or epidermal growth factor, lygan, which is a product that we believe is going to be of particular importance in breast cancer, lung cancer, and ovarian cancer, diseases that are of particular concern to women—obviously, of concern to men as well, but of particularly concern to women.

This is just one example of the kind of research that goes on at Boston University, but more than that, it is also a demonstration of the commitment of this university to technological transfer whereby we move an idea out from the laboratory into commercial production, into clinical trials, and eventually to the marketplace, so that the fruits of medical research can be accelerated and brought to the American public earlier.

Also, from an economic standpoint, it is important in keeping this technology and the jobs that are associated with it here in this country. This indicates some of the rather innovative developments that have taken place at Boston University, and our opportunity to have you here and to let you know in more detail about the research that goes on in our facility and to have you visit our facility is, of course, a great honor for us.

Thank you.

Dr. CHOBANIAN. Next, I'd like to introduce Commissioner Judith Kurland, who brings greetings from the city of Boston as well as from Boston City Hospital.

Commissioner Kurland has been an extremely effective leader of Boston City Hospital and, in her role as CEO of that hospital, has brought about the development of the magnificent new facility which will open up in August. In addition, as head of public health in the city, she has spearheaded the drive to improve the health of inner city inhabitants.

Commissioner Kurland. [Applause.]

Ms. KURLAND. It is a pleasure to welcome Senator Kennedy once again to Boston University medical campus and, on behalf of the Mayor of Boston and everybody at the Department of Health and Hospitals, we are very grateful that you are here, as we are grateful that you are there in Washington taking care of us.

I just want to make a couple of remarks. President Silber mentioned a lot of the firsts at BU. I want to remind people that the Thorndike Laboratories at Boston City Hospital were the first research laboratories at any hospital in the United States, and we still continue at the Thorndike to do excellent clinical research, excellent basic research, with the special emphasis that we have always had, which is to look after the needs of people of the inner city. The nature of those people change, the type of those people change, but the fact that there are special problems that come from poverty, from the newness of being immigrants, from oppression, have never changed.

I am the last person who would say that it doesn't make a difference to have a woman at the top. And we are very grateful for Dr. Healy and what she has done in her short tenure. There are a lot of men who care desperately about the problems of women and the diseases of women, but it does seem to make a difference when somebody comes in with a little bit of power and authority and to recognize how high breast cancer rates and how many women die of breast cancer, to recognize that women die of heart disease at least as much as men—in fact, that they actually die of heart attacks in the first year after heart attacks more than men do.

It is interesting that sometimes we notice things that perhaps other people wouldn't. So we are very pleased that you are there.

I once several years ago was talking to some researchers, male researchers, about the incidence of heart disease and the incidence of some other diseases and the fact that, although the rates were higher for women, all the research was done on men. And the answer, which all of you in this room who do research will have heard, is: Well, there's that reproductive factor. And I figured if we could adjust for the "reproductive factor," then what kind of researchers would be all be? Of course, it never explained why no research was done on postmenopausal women, but I didn't want to bring that up at the time.

It is my pleasure, actually, to introduce the chairman of this committee, who has done so much on the issue of women's health, and he has been constantly pushing, whether there was a male in that job—and I'm sure Dr. Healy will attest, when there was a female in that job—to push for more and more, for a more enlightened view of where research money needed to go and what it needed to go for.

In the last session, Senator Kennedy has authored bills that not only increased the amount of funding for breast cancer research at NIH, but in the wonderful, "guns to butter" argument that so many people make but don't do anything about, he actually, since under Gramm-Rudman I understand couldn't cut the defense budget any more, got the Defense Department to spend some money on breast cancer research, which I think is a wonderful brilliance of parliamentary understanding, and we are very grateful that he managed to do some of that that got the peace budget started. [Applause.]

But a lot of what he also did was to make sure that now that there is an interest in and money for women's health research, that it be spent well. And you will understand if I say that there are

sometimes people who will take advantage of wherever the money is to do things that are perhaps inappropriate. So some of the bills that he authored and had passed were bills to make sure that mammography met certain standards, to make sure that we looked into the results of early disease in women so that they were not affected by infertility and other sorrows of having an early disease.

So he is constantly thinking actually about the next generation and not just thinking about what we need to do today.

One of the speakers you will hear today I need to point out—and I apologize to the others for not doing it, but one can mention one's own—is Hortensia Amaro, who is doing a lot of work in the city with poor women and with women who are drug-addicted and pregnant. That is the one thing that I would ask this panel to concentrate a great deal on, which is the greater discrepancies in the health status of the poor and women of color; that as sorrowful as has been the neglect of women in all health research, the neglect of women of color and women of poverty has been even greater, and their diseases show that.

The rate of disease, heart disease, death from heart disease, from stroke, of women of color is even higher than that of white women. That is an area of research that must be looked into and must be given full attention. And I would like to suggest that one of the ways to do that is to require that large studies that go to any institutions must be coupled with a partnership with those institutions, like Boston City Hospital but like other hospitals, public and private, around this country that have historically disproportionately cared for the poor and for people of color, to do research on upper middle class, well-insured, white people, whether male or female, and then try to prove something about it for people of color and in poverty will not give us the results that we need to have.

So I would suggest that we must always include those disproportionate providers in our research projects.

Having said that, it is my pleasure to introduce to you a man who has always been our champion—a champion of women, a champion of people of color, of people of poverty and the institutions that care for them, and wonderfully, has never kept silent—Senator Edward Kennedy. [Applause.]

OPENING STATEMENT OF SENATOR KENNEDY

The CHAIRMAN. Thank you very much, Judith Kurland, for your extremely kind and generous words. As a Member of the U.S. Senate, I know all of us in Massachusetts and certainly the country, are very grateful to you for your leadership on many of the issues you have touched on today.

I think all of us know that we face great challenges in a wide variety of different areas of public health policy in this city. I think your clear and eloquent voice of leadership on women's issues and the problems we are facing in our schools and in our hospitals, has really been something all of us in health policy issues greatly value. I am very grateful to you for your efforts in trying to deal with some of these public policy issues, and for your friendship over the years.

To the dean and President Silber, I want to thank you very much for affording us the opportunity to be here at Boston University. I

think all of us know that Boston University is one of our outstanding educational institutions recognized for its extraordinary leadership in the medical sciences and medical research. The magnificent new building that will soon be completed will be on the cutting edge of research. It will make such a difference not only to the people here at Boston City hospitals, but nationwide. We are very grateful to President Silber and the dean. All of us in the Senate who are concerned about research and medical education pay tribute to what Boston University means and what it is doing here today.

Just at the outset, let me say that today's hearing is only one more step in a continuing process by our Senate Labor Committee. By inviting the Director of NIH, Bernadine Healy, and bringing together a really outstanding panel dealing with women's health issues, we continue this process. Last May, we held excellent hearings at the Faulkner Hospital on some of the preventive health care issues affecting women, particularly in the area of breast cancer. We were at the Brigham Women's Hospital in June of last year and listened to some of our enormously important researchers. We thought it was enormously important as we begin a new Congress, to deal not only with the critical issues of employment in terms of overall health policy issues, but to recognize the singular opportunity and gaps that exists today in the areas of basic and clinical research involving women in our society. This is a matter which is of enormous importance, not just as a public policy issue, but as it really affects families, and as it affects women in our society, and around the world.

So this is really the focus and the purpose of these hearings today. I will place my statement in the record. I listened to Judith Kurland identify the various areas where we are behind in terms of research, basic research and clinical research, and we are going to hear a good deal about those particular areas. My opening statement identifies a number of these areas as well as the trends which have taken place in recent times.

So we'll move right ahead with the hearing.

[The prepared statement of Senator Kennedy follows:]

PREPARED STATEMENT OF SENATOR KENNEDY

First of all, I want to express my appreciation to Judith Kurland for that warm introduction. She does an excellent job as Boston's Commissioner of Health and Hospitals, and I'm honored to be here with her this morning.

I also want to acknowledge two other leaders in education in our State who are also outstanding innovators here at B.U.—your president, John Silber, and your dean, Aram Chobanian. They've put B.U. in the front ranks of American education and American medicine, and I commend them for their leadership.

Our topic this morning is women's health, and the role of the National Institutes of Health. NIH is the most renowned medical research facility in the world. The work of NIH scientists, and the work of thousands of other researchers at institutions throughout the country who receive NIH support, are outstanding achievements for the United States and have made us the world leader in countless areas of basic and clinical research.

But the same cannot be said for women's health. In recent years, irrefutable data have demonstrated that there were major gaps in knowledge about the causes, treatment and prevention of diseases in women. To cite just a few examples:

Every year, 90,000 women die as a result of strokes.

Fifty percent of all women who have heart attacks die, but only 31 percent of men, within a year.

Lupus occurs nine times more often in women than men.

More than 7 million women have diabetes and every year diabetes contributes to the premature death of 75,000 women.

Lung cancer has surpassed breast cancer as the leading cause of cancer death in women. In 1991, 51,000 women died from lung cancer, and 45,000 women died from breast cancer.

Today, 1 in 10 women will develop breast cancer, compared to 1 in 20 in the 1960's.

Most of the biomedical knowledge about the causes and treatment of disease comes from studies on men. The results of these studies have then been applied to women's health care. The relative lack of direct research involving women has resulted in second rate care for millions of American women. The challenge we face is to remedy that injustice as soon as possible.

As one of our first actions in the new Congress, we intend to pass new public health legislation to close the gap. The vehicle will be the NIH measure vetoed last fall by President Bush because of its provisions on fetal tissue transplantation research. President Clinton intends to resolve most of that controversy by issuing an Executive order, and he will certainly sign the legislation we send him. Here as in many other areas, the years of gridlock are over.

The new legislation will make women's health a top priority at NIH. The bill ensures increased participation by women in clinical studies. It guarantees that NIH will expand the number of women scientists. It provides additional funding for research efforts on breast cancer, ovarian and cervical cancer, osteoporosis, and reproductive health. It will be a giant step toward remedying the failures and the neglect of the past.

Our hearing today will focus on these issues.

We are fortunate that Dr. Bernadine Healy, Director of NIH, could be here with us this morning. Under Dr. Healy's leadership, NIH has developed a comprehensive research agenda on women's health and has made an excellent start in addressing these concerns.

We will also hear from a group of prominent scientists and clinicians, who will discuss their research and its importance for the future of women's health. They will also discuss the role of the NIH in addressing these concerns.

I welcome all of our witnesses, and I look forward to hearing their testimony.

The CHAIRMAN. I would like to now introduce the Director of NIH, Dr. Bernadine Healy. Under Dr. Healy's leadership, the NIH has developed a comprehensive research agenda on women's health and has made an excellent start in addressing these concerns. We were unable to put into law last year the NIH authorization legislation that included fetal tissue transplantation. We understand that one of the earliest actions that will be taken by President

Clinton will be an Executive order to lift the ban that has existed since 1988.

But the first order of business, the first legislation, S.1, designating the kind of priority that it will have for the Senate of the United States, will be increased authorization for NIH and the women's health agenda. That will be the first bill that will pass the Senate of the United States, and we will pass it out of our Labor and Human Resources Committee less than a week after the Presidential inauguration, and I have every anticipation that it will pass the U.S. Senate a few days following that.

So this is something which is of great importance and hopefully, will indicate where we are as a country and where we are as a society.

We will also hear from a group of prominent scientists and clinicians who will discuss their research and its importance to the future of women's health and the role of the NIH in addressing those concerns.

In welcoming Dr. Healy, I want to also express appreciation for her willingness to talk with many of us in the Congress and the Senate about many of these public policy issues. She has been a friend and an advisor, and I think she has really distinguished herself as a leader of the NIH.

So we are very glad to have her return to Boston and to speak before our committee today.

Bernadine Healy, we thank you for being with us this morning, and we look forward to your testimony. [Applause.]

STATEMENT OF DR. BERNADINE HEALY, DIRECTOR, NATIONAL INSTITUTES OF HEALTH

Dr. HEALY. Thank you, Mr. Chairman.

I greatly appreciate the opportunity to appear before you today to discuss the National Institutes of Health's research activities related to women's health.

We at NIH greatly appreciate Senator Kennedy's work on behalf of NIH in general and also women's health issues. This is certainly an exciting and exhilarating time to be a woman in the United States. It is also a time of hard choices and high anxiety.

Today, women have more opportunities and more hard choices than ever before in history. A recent hit record by Bonnie Raitt, who started out singing in coffee houses here in Boston, talks about the kind of difficult choices that confront women in America today. The song is called "Nick of Time," and I would like to quote a few of its lyrics that seem pertinent to today's hearing.

"A friend of mine, she cries at night, and she calls me on the phone; sees babies everywhere she goes. She wants one of her own. She has waited long enough, she says, and still can't decide. Pretty soon, she'll have to choose, and it tears her up inside. She's scared, scared to run out of time. I see my folks are getting on, and I watch their bodies change. I know they see the same in me, and it makes us both feel strange. No matter how you tell yourself, it's what we all go through. Those lines are pretty hard to take when they're staring back at you. One day, the choices get so hard, there is so much more at stake. Life gets mighty precious when there's less of it to waste."

I think that most women today can relate to those lyrics, whether they are sung or spoken. Women in their twenties and thirties are faced with choices about when and if to have children, and anyone over the age of 45—indeed, anyone who has lost a friend or loved one to illness—knows that life does get mighty precious when there's less of it to waste.

To those of us in medical research, human life has always been precious, and death and disease are the constant reminders that inspire our efforts.

A problem that the medical community today faces is that our knowledge of many common disorders is based almost entirely on studies that have used men as the standard to determine research priorities and to evaluate the effectiveness of treatment. As a result, judgments regarding prevention, interventions and treatment therapies for women have sometimes been inappropriate, if not entirely lacking. This is because medical research of the past 20 years has suffered from the assumption that women are just like men.

Women, too, have suffered as a result. Lives have been lost because the differences between men and women were not recognized or evaluated.

The NIH Agenda for Research on Women's Health is about making research reflect these differences and reflect reality. The NIH Office of Research on Women's Health plays a pivotal role in carrying out that agenda. The office is charged with three critical objectives. The first is to ensure that in all research supported by the NIH, the important issues that pertain to women's health are adequately addressed. Such issues are related to diseases, disorders and conditions that are unique to or more prevalent among or more serious in women. The office also considers cases in which medical interventions involve different risk factors for women than for men.

The second objective is to ensure appropriate participation of women in clinical research, especially clinical trials. The office's third key objective is to encourage more women to pursue careers in biomedical research, especially in pivotal roles within both clinical medicine and the basic research environment.

In the past year, the office has developed a comprehensive agenda for research into women's health which places a high priority in such diseases and conditions in women as breast and ovarian cancer, osteoporosis, cardiovascular disease, stroke, bio-behavioral issues, and sexually-transmitted diseases, among others.

The agenda also addresses diseases and conditions that have a lower prevalence among women, but still exact a devastating toll. Consider just a few staggering statistics. Some 180,000 women were diagnosed with breast cancer last year, and 46,000 died. Today, a woman's lifetime risk of developing breast cancer is one in eight. In 1940, that number was one in 20.

Thirteen thousand women died of ovarian cancer last year. Osteoporosis affects approximately 25 million Americans, the majority of whom are women. Osteoporosis is the underlying cause of approximately 1.5 million fractures per year, and the annual cost of treating hip fractures alone is almost the entire budget of the NIH—about \$9 billion.

The cost in terms of human suffering and social isolation and entrance into nursing homes caused by immobility are impossible to calculate.

Cardiovascular disease remains the leading cause of death and disability in the United States for both men and women. The annual costs are estimated to exceed \$100 billion a year, and more than 240,000 women die from heart disease every year. It is the biggest killer of women.

More than 50 percent of pregnancies are unplanned. The United States has the highest rate of abortions of all industrialized nations, and this high rate can be linked to at least two factors—sexual behavior and the availability of contraceptives that meet the needs of all segments of our population.

In part to counteract these differences and conditions among American women, the NIH has launched a major study of women's health as part of a broad-based, multidimensional initiative for women's health. The Women's Health Initiative, headed by Dr. William Harland, is a 14-year, \$625 million effort that will involve approximately 150,000 women, many from Boston, at 45 clinical centers across the country. It will be the largest clinical study ever undertaken in the United States of men or women.

Some have criticized its scope—large science versus small science. Some have said that it is too ambitious or even too expensive. But big problems demand big solutions. The shameful knowledge gap plus the size and diversity of our population demand a powerful response—and by that, I mean not only statistical power to answer pressing questions, but also dollar power. Although some think \$625 million is too much of an investment over those 14 years, I should point out that over that 14 years that it will be spent, that commitment represents less than 4 percent of NIH's clinical research expenditures.

The Women's Health Initiative will develop a series of recommendations concerning diet, hormone replacement therapy, vitamin supplements. Through clinical trials conducted in large and small communities nationwide, the study will evaluate various approaches for motivating women from diverse groups to adopt healthy behaviors, such as following a well-balanced diet, taking nutritional supplements, stopping smoking, physical exercise, and getting regular medical checkups.

This means the focus of the Women's Health Initiative will be on healthy women, on understanding diseases within the context of a woman's total health and her total well-being, not just a specific disease. Particular emphasis will be given to reaching minority women and groups that have traditionally been underserved by the medical establishment—a comment that we just heard from your commissioner.

The recommendations formulated through the initiative will serve as signposts to help women and their physicians weigh the evidence and make more informed decisions. In too many cases, women are put in the position of having to make unfair and uninformed choices about their health.

For example, suppose your mother goes to see her doctor for a routine checkup. If she asks about avoiding osteoporosis, she might be told about the positive correlation between bone strength and

estrogen replacement therapy. When she sees her cardiologist, she is told to reduce her fat intake and consider the possible benefits of estrogen. Then she goes to see another doctor who tells her that to reduce the risk of cancer, she should avoid hormone replacement therapy and focus on reducing fat and increasing fiber in her diet. Another doctor will tell her to increase calcium in her diet.

Whatever her choice, based on what is currently known, she might be making a choice that could improve one condition and at the same time initiate a lethal problem elsewhere.

I believe that all women and their physicians need better, integrated information before they must make those choices. By focusing on the total, integrated health of the woman, the Women's Health Initiative will improve our understanding of how treatment interacts and affects a woman's total well-being, and enable us as physicians to provide the important choices that a woman must make.

Let me tell you about some other important studies relating to women's health. The breast cancer prevention trial is one important one that has received some recent attention. Prevention and informed choice are the heart of the National Cancer Institute's breast cancer prevention trial. Women age 35 and older who are at increased risk for breast cancer are being recruited for this research study. It is hoped that approximately 16,000 women will choose to participate in this protocol, which is designed to determine if taking the drug tamoxafin, a hormone-like agent, will prevent breast cancer.

Tamoxafin is the most widely prescribed anti-cancer drug in the world. It has been used for almost 30 years to treat patients with advanced breast cancer, and since 1985 as adjuvant therapy after radiation and/or surgery for early-stage breast cancer. It is estimated that tamoxafin could reduce the incidence of primary breast cancers in postmenopausal women by 30 to 50 percent. Preliminary reports also indicate that tamoxafin appears to have a beneficial effect on lipid metabolism and on bone mineral density. Therefore, it may have a beneficial effect on preventing heart disease and bone disease.

Another piece of good news in cancer research is that a new drug, the first new drug for cancer treatment that we have had in 5 years, has just won approval by the FDA. Taxol, developed by the National Cancer Institute through its contract screening laboratories, has just gained FDA approval for ovarian cancer and is being tested for breast cancer at this very time.

Although clinical trials address the needs of patients of today, I must stress that basic research is at the core of health. Basic research is still the single best investment in preventive health. The importance of basic research as a complement to studies such as the Women's Health Initiative and the breast cancer prevention trial cannot be overstated. Results of this basic research will hold the key to prevention, to diagnosis, to treatment, and indeed, to cures.

Let me give you just a few very exciting examples of what basic research means to our patients. Basic research in the field of oncology is aimed at discovery genes and gene products that are important in the development of breast cancer as well as other cancers.

In one promising discovery, a tumor suppressor gene, P53, has been found to be deceptive, or absent, in a number of common malignancies including breast cancer. NIH-supported investigators have also observed the deletion of a gene which is a metastasis suppressor in more than 60 percent of primary breast cancers.

The application of genetics to cancer research is probably one of the most exciting developments in present-day oncology. Dr. Frances Collins, whom I recently nominated to head NIH's Human Genome Project, and Dr. Mary Claire King, of the University of California at Berkeley, are both trying to identify the gene that predisposes some women to breast cancer. There is little doubt that one of them will identify that gene very, very soon. At the NIH, we want to be prepared to act quickly on that vital new knowledge, and so we are now, as part of our strategic plan, setting up a new Cell Biology Unit.

Research conducted by NIH's Director of Intramural Research, Dr. Lance Liotta, has shown that patients whose breast cancer tumor cells contain high levels of the protein NM-23 have few metastases and do much better, have a better prognosis, even though their cancer might look the same under the microscope.

The converse is also true—patients with low levels of NM-23 tend to die sooner because they have many metastases. Levels of NM-23 could prove to be important indicators for treatments of many forms of cancer. As we look to the future, we would expect that what we learn from such research will provide a vital groundwork to develop a vaccine and molecular approaches to therapy for breast cancer as well as other cancers—vaccines that might prevent the spread of a primary tumor, which ultimately is what leads to death.

Another research-based strategy for cancer prevention and treatment is the discovery of a new protein, TIP-2, by NIH scientists. TIP-2 can block cancer cell invasion and will prevent new blood vessel formation necessary for breast cancer growth and metastasis.

Basic research studies into the mechanism of signalling pathways in cancer cells has also led to the identification of a whole other new class of oral anti-cancer agents. CAI is one of these and is presently in Phase 1 clinical trials at the NCI for patients with breast cancer as well as other solid tumors.

There are other major advances throughout the NIH that must be taken into consideration. Let me list a few very quickly. The National Institute of Allergy and Infectious Disease has developed improved diagnostics for a number of disorders at the molecular level—for example, sexually-transmitted diseases, which indeed are an epidemic in this country. Sexually-transmitted diseases constitute an area of women's health where we face problems of epidemic proportions. Like lung cancer, it is an area in which behavior plays a major role, and it is an area in which the social stigma that used to be associated with cancer still figures prominently. If cancer is a scourge of older women, clearly sexually-transmitted diseases have become a scourge of younger women.

The Centers for Disease Control estimates that 6 million women in the United States, half of them teenagers, acquire a sexually-transmitted disease each year. Most of these infections will cause

no immediate symptoms. One of infectious agents, human papilloma virus, or HPV, plays an important role in causing cervical cancer, which killed nearly 5,000 women last year. Approximately 2.5 million women acquire chlamydial genital infections each year. Because these infectious lack symptoms, they often lead to delays in diagnosis and treatment. As a result, over one million women are treated for pelvic inflammatory disease each year.

Again, because of unrecognized symptoms, many, many more go undiagnosed and untreated. And as a consequence of the scarring, between 17 and 25 percent of women who develop PID become infertile.

These facts are particularly devastating when you consider that roughly 70 percent of women who develop PID are under the age of 25, and 75 percent have never had a child. Infertility has been a concern also of the NIH, and we have now established a Reproductive Endocrine Network of specialists to work on these problems.

Sexually-transmitted diseases are also associated with tubal pregnancies, which are six to ten times more prevalent among women who have had an earlier episode of PID than those who have not. Tubal pregnancy is the most common cause of pregnancy-associated-death among black teenagers. For women who are able to conceive, infections such as genital herpes chlamydia and syphilis, are transmitted during pregnancy or at birth and result in the death or permanent disability of 100,000 infants each year.

A new sexually-transmitted disease is now the fifth leading cause of premature death in women. That disease, AIDS, is the leading cause of death for women ages 13 to 49 in several American cities. In fact, in 1990, the largest proportional increase in AIDS cases occurred among women. Drug use and heterosexual contact are the leading forms of transmission. As a result of perinatal transmission, AIDS is the leading cause of death among minority children.

Prevention and control of sexually-transmitted diseases including HIV infection are fundamental to the health of women and their children. Many sexually-transmitted diseases including HIV are transmitted more easily from men to women than from women to men. If infected, women are more frequently asymptomatic, and less likely to seek care. It is an unfortunate fact that sexually-transmitted diseases are more difficult to detect in women than in men. It is also an unfortunate fact that even if they have symptoms, women with sexually-transmitted diseases often don't seek care because these diseases in women still carry a tremendous stigma in many communities. A sexually-transmitted disease in a man, with the exception of HIV infection, is still seen either as a coming of age or an amusing mishap.

We can reduce the stigma to these diseases by talking about them and treating them as what they are—threats to public health, threats to women's health. Just as the old stigma associated with cancer was diminished when public discussion began to center on the biological components of the disease—cells, tissues, metastases—so it may be with sexually-transmitted diseases.

As I mentioned earlier, despite widespread availability of contraceptive methods, women still report many unintended pregnancies.

During 1985 to 1987, for example, the survey of women of reproductive age showed that 53 percent of pregnancies either occurred earlier than wanted or not wanted at all.

The problem of unintended pregnancies is particularly severe among the young. Reports of women under 20 years of age indicate that 84 percent of their pregnancies are unintended.

In fiscal year 1992, NIH spent \$14 million on the development of new contraceptives, or less than 25 cents for every woman of reproductive age. In addition, \$93 million was spent on basic biomedical research on reproduction which may lead to the eventual development of improved methods and the alleviation of infertility. Together, these two programs account for less than \$2 for every woman of reproductive age.

Clearly, we would like to do more to provide women and men with more and better choices when it comes to reproductive health.

I would like to conclude with the words of a woman who worked very hard to create new choices for women. And every woman in this country has benefited indirectly from her work. Emmeline Pankhurst fought to win for English women the right to vote. In 1912, she led a demonstration in which women broke windows in Parliament Square. For this, she received a three-year prison sentence. She defended the demonstration, saying: "Why should women go to Parliament Square and be battered about and insulted and, most important of all, produce less effect than when they throw stones? We tried it long enough. We submitted for years, patiently, to insult and assault. Women had their health injured. Women lost their lives. After all, is not a woman's life, is not her health, are not her limbs more valuable than panes of glass? There is no doubt of that. But most important of all, does not the breaking of glass produce more effect upon the government?"

Today, our answer to the questions posed by Emmeline Pankhurst is different from the British Government's response in 1912. Yes, we do value women's lives and health. That is why the NIH is working to improve women's health, and that is why we are here today. And that is why, Senator Kennedy, I know, you are having this hearing.

Let's work together to ensure that women have adequate information to make informed choices about their health.

Thank you very much. [Applause.]

The CHAIRMAN. Thank you very much, Dr. Healy.

Certainly, hearing you and reading your testimony, there are many reasons to be hopeful, but also many reasons to be concerned and troubled. We are very, very appreciative of your comments and the leadership you are providing.

Let me ask a few questions. On endometriosis, 5 million women are afflicted with that condition, and scientists are really not sure how the condition occurs or how it causes very disabling pelvic pain, ovarian cancer, and infertility.

Could you tell us a little about NIH-supported research in this area?

Dr. HEALY. Yes, Senator. Actually, we have come a long way on endometriosis just in terms of our thinking. I can tell you that more than 20 years ago, when I was a medical student here in Boston, the conventional wisdom in our medical textbooks was that

endometriosis was punishment for women who delayed childbearing beyond the age of about 22. Of course, for the handful of women medical students who were beyond 22, that was pretty distressing information to be reading from those lofty pages in our gyn textbooks.

We have in fact learned that this is not God's punishment, but in fact it is based on biology and that in fact we can understand it better, and we can probably prevent it.

The NIH over the past several years in particular has put much more emphasis on endometriosis. Back in September of 1991, we held a special workshop to try and identify gaps in our knowledge both of our understanding its pathophysiology as well as possible interventions.

There is some provocative information that a woman's immune system may be a factor in making one woman more susceptible than another. There is no doubt that delayed childbearing is one factor, but only one of many.

In fiscal year 1992, NIH supported approximately 20 grants on endometriosis. They have recently issued an RSA to fund several more grants, and we hope that we will come up with some of the answers that have not been forthcoming to date.

The CHAIRMAN. You outlined in your testimony a number of areas where you are moving ahead in the research of the immune-mediated diseases—lupus, chronic fatigue syndrome, and multiple sclerosis—appear to be primarily affecting women. These diseases were outlined by Dr. Kurland and yourself. Could you tell us the new ways to either treat or possibly prevent these diseases, or give us some idea of what progress has been made?

Dr. HEALY. Well, across the board, women do seem to be more susceptible to the immune-mediated diseases like lupus, and what we are finding is that there are both genetic as well as environmental components. Some diseases, for example, lupus, disproportionately affect African American women, and there is also some evidence that there may be some specific antigens and some genes that may predispose one woman as opposed to another to these disorders.

We have become more sophisticated in some of the types of therapy that we can use that target one particular component of the immune system, and the benefit of that in the long run, of course, is that it may indeed mean less side effects with regard to therapy.

Numerous institutes across the NIH are working on these immune-mediated diseases such as lupus, arthritis, chronic fatigue system, and they include not only our Institute for Allergy and Infectious Disease, but the National Institute on Aging, and the National Institute for Child Health and Human Development, which has a major program on women's health which includes these diseases.

I think there is no doubt that ultimately, the answers will come from a much better understanding of molecular immunology, and here again, I think this is the realm in which basic science ultimately will be the answer, because probably some of the fundamental molecular, immunologic issues cut across many of these diseases.

I would add one general comment, and that is that one of the unfortunate things about women's health in general that is so difficult for women and frustrating for medical researchers is that the chronic debilitating diseases are more apt to be diseases of women. And although we know women live a good six or 7 years longer than men, so often their quality of lives are disrupted by these chronic debilitating diseases across the life span.

The CHAIRMAN. In previous hearings you have discussed bringing both basic and clinical women researchers into the whole research process. What kind of luck have you had in terms of recruiting women into those particular positions, and what can you tell us about future possibilities.

Dr. HEALY. Well, as part of our effort on women's health, we have included a very aggressive program in addressing the issues of women as medical scientists. And this does not just mean numbers, but it also means quality of those numbers, namely, moving women into leadership positions.

Over the past 2 years, we have seen some important increases within our own NIH laboratories. We have gone from about 29 percent to now over 35 percent of our fellows, our younger scientists, are women.

Some of the figures that I am particularly pleased with, however, are the conversion of women who are NIH scientists from nontenured to tenured positions, which is a sign of women at the higher levels. There, it used to be a conversion rate of about 15 percent were women, and it moved quickly to about 30 percent in 1991, and in 1992, the number rose to over 50 percent of those tenured conversions were women. So I think that we are seeing some advances of women across the leadership span, if you will.

In addition, something that women in the academic community across the country I think need to be more sensitive to is that women who are in the scientific community have to themselves be willing to serve on things like NIH study sections. I am sad to report that our highest resignation rate on NIH study sections, which is an important component of putting women in leadership positions and having them be at the controls in terms of determining who gets funded and who doesn't get funded, and also learning how to submit grants and be effective competitors in the very competitive process of getting grants, that our highest resignation rate is among women. We have paid a great deal of attention to recruiting women to study sections, and in fact, I think that my office rejects now about one-third of study section slates because they don't have enough women or African Americans or other minority groups represented.

Now, that doesn't mean—and I know I'm not allowed to talk about quotas—we are not talking about quotas, but what we are talking about is trying harder to see that we have women represented and minorities represented on these important pivotal committees. As you know, Senator, the peer review system of NIH is really the system that determines science policy, that determines what gets funded and what doesn't; it really determines what NIH is all about.

The CHAIRMAN. To continue this a bit, you mentioned before, there are specific diseases and conditions which are directly related

to gender and ethnicity. Diseases such as tay-sachs for example. What are you doing in terms of collecting information and how you are processing it, using it and evaluating it?

Dr. HEALY. There was a time when our approach in general to clinical trials, where we actually develop the means or the knowledge base to translate information from the laboratory to meaningful information to patients and to the public. Clinical trials were often viewed as being very homogeneous, because if you had a homogeneous trial with a very "clean," so to speak, population, then you could use fewer numbers to get your answer, and you could have a very scientifically "pure," if you will, kind of trial. And in fact that is part of the reason why so often people who were older were excluded from trials and also why so often the trials were restricted to the male population. There was a sense that men were the normative standard and that you could extrapolate information from the male population to the female population.

I think we have become much more sophisticated in recognizing that there are not only gender differences, but there are age differences, and there may be ethnic differences, and that we have to have perhaps less fastidious trials to answer some of the big questions, but trials that will be meaningfully related to the populations that we serve. And one thing that is true about this country of ours is that it is an incredibly diverse country, and its diversity is changing all the time, both in terms of ethnicity and also age. And I think NIH has become more responsive to the needs of the public by seeing to it that our major clinical trials do have attention to diversity.

The Women's Health Initiative is just one example of where we are going to great lengths to make sure we have adequate representations of minority populations. We have also instituted a policy which got very, very sharp teeth in it a few years ago, to make sure that all clinical trials conducted by NIH, small trials or large trials, represent the diversity of the population if it is appropriate. Obviously, you are not going to ask a clinical trial of prostate cancer to include women. So we are using sense when we invoke that, but indeed, we are looking at every trial with that eye to make sure that it does gather information that can be related back to the public at large.

The CHAIRMAN. Could you tell us about the initiatives being developed at NIH at the Cancer Institute, the Heart Institute, and maybe the Institute on Aging, regarding women's health, and disease prevention, and your plans for the future?

Dr. HEALY. I think it is fair to say that all of our institutes have always been very aggressive about having prevention programs. For the most part, they tend to focus on prevention within their own mission. For example, the Cancer Institute is worried about preventing cancer, and the National Heart, Lung and Blood Institute is worried about preventing lung disease and heart disease.

One area, however, where perhaps the institute model has allowed some things to fall through the cracks is prevention in an integrated sense, as I alluded to in my testimony. Prevention, nutrition—these are areas where you have to look at the integrated discipline. When a patient wants to prevent disease, they want to keep healthy, and it doesn't much matter if you are the particular

victim what the disease is, if you are going to die from cancer or heart disease; the fact is, you want to prevent both of them. You want to prevent bone disease, you want to prevent sexually-transmitted diseases.

As part of the NIH strategic plan which we have been working on over the past 2 years, we have made prevention and nutrition a major area of emphasis, and all of the institute directors have come together, acknowledging that these are trans-NIH issues; that in addition to working on these issues within each of the institutes in a disease-oriented way, that we also have to work in an integrated way, and that thinking is actually largely reflected in the Women's Health Initiative, which is focusing on the integrated health of the woman, and looking at an integrated diet that protects her against or minimizes her risk from a whole host of diseases that she is susceptible to.

And I think one of the things that has been very gratifying, Senator Kennedy, is the extent to which all of the institute directors have been responsive to this approach and recognize that in certain areas like women's health, like the health of underserved populations, like nutrition and like prevention, that we do need to have trans-NIH efforts.

In the Women's Health Initiative, I think we have kind of a model of emphasis on prevention as a very meaningful approach because, as I mentioned, women are living longer but not necessarily better, and many of the things that are robbing women of quality of life as they get older, many of the issues that force women into nursing homes—three out of four elderly residents of nursing homes are women—much of that is preventable. And in addition to preventing a terrible human toll, the economic toll that occurs with chronic debilitating diseases in elderly women will also be mitigated if we are more aggressive about intervention.

The CHAIRMAN. I think that is an enormously useful point. It is not the primary one in terms of all of our interest, because we are interested in the health policy questions and the health of the individual, but the spinoff in terms of the finances is important as well.

Women and smoking. I think most of us understand the decline in smoking that is taking place in the general population and we applaud this. However, the recent discovery that smoking is increasing dramatically in teenage women is of tremendous concern. The danger that this increase may lead to early lung cancer and prenatal and neonatal complications in this population is of great concern. Of equal concern are the recent reports confirming the dangers of passive smoke inhalation.

There are obviously a lot of public policy questions which we have to face in the Congress, in terms of advertising and subsidizing, but what can you tell us about your own studies regarding smoking by young women and what we can do about it?

Dr. HEALY. Well, Senator, one of the sad realities that we have seen over the past 20 years has been the increase in smoking among women. We now know that lung cancer has surpassed breast cancer as the major cancer killing women in this country, and that is largely due to smoking.

Unfortunately, for a long time, smoking was associated with women's liberation, and the advertising certainly reinforced that

notion. "You've come a long way, Baby," was synonymous with being able to smoke, and that is a perverse outcome, of course, and one that we've been fighting.

In virtually all of our prevention strategies within the Cancer Institute and within the Heart, Lung and Blood Institute, we have programs that focus on mechanisms to stop women from smoking. We have programs that are targeted on younger women in particular, where we know that they are smoking more than young men. Within the Women's Health Initiative, we actually are studying various strategies for smoking cessation, and one component of the Women's Health Initiative is to actually look at assorted healthy behaviors including diet, smoking cessation and exercise, and find out how we can more effectively convince the public that we are trying to serve that they should adopt these healthy behaviors.

With smoking as well as other things, I think it is important to take an integrated approach. Often, the person who exercises and watches their diet is also the person who is not going to smoke. And if we look at it as an overall healthy lifestyle and the benefits of a health lifestyle, I think we will in the long run have a positive impact.

The CHAIRMAN. I understand one of the American growth industries in the Soviet Union is producing cigarettes over there.

Dr. HEALY. That's correct.

The CHAIRMAN. Reference was made earlier to what we appreciate as the movement in DOD toward research in terms of breast cancer and women's health issues. I was interested as a member of the Armed Services Committee in how that is moving along. How is DOD coordinating with the NIH in terms of moving those resources out of DOD over to NIH? Where is the flow line? Are you running into problems? Is it moving well? Are there things that we ought to be watching more closely and acting more vigorously to try to make that happen?

Dr. HEALY. First, I resoundingly applaud more money for breast cancer. Right now, the biology of breast cancer is at a stage where we really can make a difference both in the fundamental knowledge, the ability to intercede to prevent the advance of breast cancer, and also to our basic understanding which will allow new drugs and new therapies to be developed, new forms of molecular epidemiology which will allow us to restructure.

So that I don't think an additional \$200 million is excessive in terms of its ability to be spent wisely. With regard to the fact that an extra \$200 million appeared in the Department of Defense appropriation budget, I must frankly say, Senator, that I think it is mission confusion. I don't think that the Department of Defense is the place to be doing basic biomedical research, nor do I think NIH should be building bombs and tanks. But I think that NIH has made an effort to try to work with the Department of Defense. Within a week of the appropriations being signed, Dr. Browner and I went over and visited the leadership at the Pentagon that are responsible for this \$200 million. We told them that in order to spend \$200 million in research that you would likely receive about \$1 billion worth of research requests and that that does require a major infrastructure.

I think the Department of Defense has a different mindset in their approach to it. In fact, they told us they had some experience in spending money in breast cancer research because in the previous fiscal year, they spent \$20 or \$25 million on breast cancer. They were pleased to tell me that project was called "Breast One." [Laughter.] Their experience with "Breast One," they thought would help them with "Breast Two." [Laughter.]

We would obviously be willing to help the Department of Defense through this, and we certainly hope that this is a one-time appropriation and that maybe in the future we can go back to our mission orientation.

The CHAIRMAN. Good. We'll try and help you with that. It makes absolutely no sense for them to be involved in that program. NIH is the place, and I think we ought to get Mr. Aspin's attention on that issue, which we will.

We thank you so much. It has been an enormously helpful and informative presentation, and I think all of us who are concerned about these issues must certainly appreciate all the things that you are doing and have done. I want to indicate that we appreciate how accessible you have been to all of us who are concerned about these issues. You have really been enormously responsive to the constructive suggestions that are being made within the community, and we are all very, very grateful for your service.

Thank you very much, Dr. Healy.

Dr. HEALY. Thank you, Senator Kennedy. [Applause.]

The CHAIRMAN. Our next distinguished panel will identify the gaps in our knowledge regarding women's health issues and will recommend research priorities for the future in the areas of smoking, aging, hormone replacement therapy, substance abuse and diabetes.

I'd like to invite Drs. Ockene, Wei, and Rosenberg to please come forward.

The risk of women developing smoking-related diseases continues to increase each year. One hundred six thousand women die annually from smoking-related conditions. If women continue to smoke at the present rate, by the end of this century, women smokers will outnumber men smokers. The importance of understanding the dynamics of aging and the needs of older women is increasing as America ages, and imaginative research is demonstrating how many of the physical and mental problems associated with aging can be prevented or reversed.

Perhaps the most compelling question looming over women's health today is should postmenopausal women receive hormonal replacement therapy. With heart disease the number one killer of women, and osteoporosis also a major cause of death through complications following hip fracture, preventive therapy like hormone replacement could have a dramatic impact on life-expectancy and quality of life.

We'll start off with Dr. Judith Ockene, a professor of medicine and director of the Division of Preventive and Behavioral Medicine at the University of Massachusetts Medical School. Dr. Ockene will discuss smoking and women.

Dr. Jeanne Wei is chief of the Division of Gerontology at Beth Israel Hospital. She is an associate professor of medicine and direc-

tor of the Division of Aging at Harvard Medical School. Dr. Wei will discuss women and the aging process.

Dr. Lynn Rosenberg is a professor of epidemiology and assistant director of the Slone Epidemiology Unit at Boston University School of Public Health. Dr. Rosenberg will discuss hormonal replacement therapy and its possible uses in menopausal and postmenopausal women.

We'll start with Dr. Ockene.

STATEMENTS OF JUDITH OCKENE, PROFESSOR OF MEDICINE, UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL; DR. JEANNE WEI, CHIEF, DIVISION OF GERONTOLOGY, BETH ISRAEL HOSPITAL AND DIRECTOR, DIVISION OF AGING, HARVARD MEDICAL SCHOOL; AND LYNN ROSENBERG, PROFESSOR OF EPIDEMIOLOGY, BOSTON UNIVERSITY SCHOOL OF PUBLIC HEALTH

Ms. OCKENE. Hi. I am very pleased to be here today and to participate in this hearing, representing our State Medical School in Worcester, MA, which is the second largest city in New England, and highlighting several of our programs in smoking and women's health, and to bring attention to some of the key gaps in our knowledge on which the NIH might focus its Women's Health Research Agenda.

The University of Massachusetts Medical Center, one of five University of Massachusetts campuses, is dedicated to serving the people of the Commonwealth through excellence in health care, education, service, and research. It consists of the medical school, a 371-bed tertiary care teaching hospital and clinic, a graduate school of biomedical sciences, a nursing school, and a program in molecular medicine.

Although only 5 percent of its \$425 million budget comes from State funding, the Medical Center contributes significantly to the economic well-being of the city and the region, returning \$19 for every \$1 invested by the State.

UMass is awarded more than \$50 million annually in research funding, ranking second in NIH support among the ten medical schools in the Northeast, and in the upper third among all medical schools in the United States.

Among the NIH-funded research programs at the medical school are several large programs in prevention and women's health. These include research in diet, estrogens and breast cancer; community interventions for smoking cessation; cancer prevention at the workplace, and calcium and bone density in college-age women.

Prevention research, as we heard in Dr. Healy's testimony, is an important area for NIH funding as it will have one of the largest impacts on human health. I would like to commend you, Senator Kennedy, and your committee for your work on the NIH reauthorization legislation and specifically for your initiatives in prioritizing prevention research in the areas of breast and reproductive system cancers and heart disease.

I would suggest that to the extent possible, the language of the legislation should specify that a portion of these set-aside prevention moneys be directed toward community-based implementation

research which focuses both on the individual and her environment.

Although past NIH research has been essential for understanding the etiology and mechanisms of disease, I would like to suggest that a major emphasis for NIH funding now must be on taking what we have learned in basic science research, which includes, as we heard, the overwhelming conclusion that lifestyle behaviors have a major impact on disease and disability, and applying this knowledge to improve the health of women, especially, as Commissioner Kurland said, those women who are of low educational attainment and low income.

It is only through public health-type prevention research, using both environmental and individual strategies, that we will learn how to effect changes in destructive behaviors such as smoking, thus improving our efforts to reduce the attendant burden of unnecessary illness and disability for these women, their families and society.

As we heard, smoking is an excellent example of an important behavior to focus on for women's health and disease prevention because of its significant effect on coronary disease, stroke, cancer, and osteoporosis, the major causes of death and disability among America's women.

The epidemiologic data indicate that the benefits of smoking cessation even extend to older women. For example, a health woman aged 50 to 59, smoking greater than a pack of cigarettes a day, reduces her risk of dying over the next 15 years by almost 50 percent if she stops smoking.

I currently am or was the principal investigator on five NIH-funded projects in smoking and health, and I would like briefly to mention three here today.

One project which I believe is particularly relevant is the physician-delivered smoking intervention project which was funded by the National Cancer Institute. As a result of this study, we demonstrated that relatively little time of the physician—about two and a half hours of training—can significantly affect physicians' smoking intervention skills, which in turn has a significant impact on the smoking behavior of her patients.

As a result of this study, we have integrated smoking cessation training into the residency program for all of our general medicine residents and all of our family practice residents as a compulsory part of their training, which is consistent with our mission as a State institution dedicated to the goals of preventive medicine and public health.

A second important project is our National Cancer Institute-funded community intervention trial for heavy smokers, in which I am the principal investigator along with Dr. Gloria Sorenson as the co-P.I.

This 11-center collaborative study uses a community-based approach to intervention in which multiple sectors in the community, such as the schools, the workplaces, and the media, work together in a community approach. Our study has formed the foundation for the current NCI-funded Assist project, with its demonstration that, as we heard earlier from Dr. Healy, it takes a synergy between many different interventions to really have an effect—synergy be-

tween policies such as worksite nonsmoking policies, and interventions aimed at both the individual and the community in which she resides—to effect behavioral change, especially—this is important—for individuals with lower income and less education.

Another project, Senator Kennedy, which I think would be of particular interest to you and to Dr. Healy is our project funded by the National Cancer Institute, called the Well Works Project. This is a project in which Dr. Gloria Sorenson at the Dana Farber Cancer Institute and Dr. Jay Himmelstein at UMass Medical Center are also investigators. It is the first trial ever to integrate interventions to change both lifestyle behaviors and occupational exposures in an effort to prevent cancer. We think that this research, which is now in its third year, has implications not only for future NIH research, but for further reform of the Occupational Safety and Health Act.

The CHAIRMAN. Could you just elaborate on lifestyle and occupational health? How does that work?

Ms. OCKENE. OK. Thank you for asking. We have 24 worksites in Massachusetts involved in this project. The lifestyle behaviors that are of importance in the project are nutrition and smoking, and the occupational health includes teaching workers how to reduce their exposure to carcinogens. So it is an integrated approach which looks at both occupational risks and lifestyle behaviors.

We feel that this kind of an approach, as was stated earlier, is perhaps one of the best approaches to really helping people prevent all diseases, not just focusing on one.

The CHAIRMAN. In regard to the worksite, do you get the employers and the workers together on this?

Ms. OCKENE. Yes.

The CHAIRMAN. And did you have resistance from one or the other?

Ms. OCKENE. It took much effort, and as you are suggesting the possibility, it is a very challenging approach, and we did involve both the workers and the managers going up to the CEOs, et cetera, to work together on boards to develop programs for each worksite. It is a very exciting project for us, and we feel it will have major implications.

The CHAIRMAN. I'd be very interested in that because of the OSHA implications. Thank you.

Ms. OCKENE. Thank you for asking.

I am also principal investigator on NIH-funded projects concerning the physician's role in alcohol intervention and in dietary intervention.

Other projects which we are beginning, but for which we do not have NIH funding and would hope to be able to get some, include smoking intervention with low-income pregnant women—and I will return to this area in a moment—and interventions in inner city clinics where we need to be able to adapt what we have learned, as was suggested earlier, from more middle class individuals, adapt those to work with individuals who really need these interventions. But we cannot assume that the same interventions we used in previous research are directly applicable, and therefore research needs to be done to actually adapt these interventions.

My involvement in smoking and health also includes being a scientific editor on the 1989 25th anniversary Surgeon General's re-

port under Dr. Koop. In that report, we summarized all of the information that we had learned in the 25 years since the first report was issued in 1964.

I was also the scientific editor on the 1990 Surgeon General's report under Dr. Novello.

My involvement with the above projects and others has led me to the following conclusions about what the priorities should be for NIH research in prevention and women's health.

No. 1, although studies have been completed addressing behavioral change in middle and higher income smokers of high educational attainment, we know very little about how to intervene with socially and economically disadvantaged smokers.

Of special concern are pregnant smokers. I would recommend that strategies for modifying smoking and other morbidity- and mortality-related behaviors engaged in by pregnant women, such as alcohol and drug use, be a research priority which is uppermost for the NIH. It has major implications not only for the women, but for the health and well-being of their children and families as well, not to mention the excessive costs to an already overburdened health care system. Successful intervention can reduce these costs.

No. 2, from my research and that of others, we have demonstrated that training physicians and other health care providers such as nurses in prevention counseling and facilitating their ability to use this skill is an effective method for helping people to alter disease-related behaviors. However, again, we know very little about how providers' preventive practices with women of low educational attainment and low income, what the effect is on these individuals and their potential long-term effects.

Research on health care providers' preventive interventions with these women must be a research priority for the NIH.

No. 3, educational and health policies need to be developed to mandate training for physicians in prevention-oriented counseling and the use of preventive interventions. Research on how to facilitate implementation of such policies and the impact of these policies on providers' prevention practices is extremely scarce, almost nonexistent, and should be an NIH priority. Physicians and health care providers make up a very important part of intervention.

In summary, my strongest recommendation is for public health-type prevention research in the area of modifying disease-related behaviors of women of low income and low educational attainment. The NIH must focus funding efforts on women in this group. We know very little about how to have an impact on their lifestyle behaviors in our efforts to prevent unnecessary illness and disability.

The benefits to be gained by such intervention are substantial, both in terms of the quality of life for the individual and for her family, as well as the costs to society both in economic terms and in terms of human suffering.

Thank you once again for the privilege to present my testimony and to represent the University of Massachusetts Medical Center. I hope that it will be useful to you, and I welcome the opportunity to be of further service.

Thank you.

The CHAIRMAN. Thank you very much. [Applause.] We'll have some difficulty in mandating the medical schools and their curric-

ula, but if we can get the AAMC sensitized to this, that probably is a start. I'd be glad to join in that effort.

Ms. OCKENE. Good. We can use all the help we can get.

The CHAIRMAN. Dr. Wei.

Dr. WEI. Thank you, Mr. Chairman, Senator Kennedy, Dr. Healy, colleagues.

I am honored and pleased to be here today to testify about a subject to which I have dedicated most of my career, and I would especially like to commend you, Senator Kennedy, for holding this hearing.

It is personally gratifying for me that Congress is directing its attention to older women. Women's issues are not limited to the childbearing years. Seventy percent of elderly Americans age 85 years and over, that segment of the American population that is currently the most rapidly growing, are women. Eighty percent of all nursing home patients are women. Therefore, issues that confront older persons are very much the issues that affect women.

The health care needs of women age 65 years and older represent a largely unconsidered area both by medical research and by our society.

Although life expectancy, as Dr. Healy mentioned, for women who reach 65 is longer than that for men, it is not clear that this longer life span is necessarily a cause for celebration. Older women are much more likely to live alone than older men. Older women are much more likely to be living at a poverty-level income. The current generation of older women are likely to have made sacrifices for others most of their lives and now deserve our support. They are the ones who endured the hardships of the Great Depression, postponed achieving their dreams during World War II years, stayed at home and raised children during the fifties and sixties, took care of their ailing parents during the seventies and eighties, took care of their ailing husbands during the eighties and nineties, and then faced or will face an old age of widowhood, loneliness and poverty. After a lifetime of personal sacrifices, these older women will face an uncertain future and have unmet health care needs which would certainly benefit from further research.

With generous support from Congress, the National Institutes of Health, the National Institute on Aging, and the Department of Veterans Affairs, the faculty members of the Division on Aging at Harvard Medical School have been actively conducting research in a number of areas that are relevant to this hearing. I would like to give just a few examples.

In the area of cardiovascular diseases, as Commissioner Kurland and Dr. Healy have told you, heart disease is the number one killer for older women as it is for older men. Women and men over age 65 develop heart failure six times more commonly than younger persons. The prevalence of heart failure in women rises at one and a half times greater than the rate in men. And contrary to long-prevailing though, impaired muscle relaxation, not impaired muscle contraction, is the predominant cause of heart failure in the elderly, especially elderly women.

This is because with advancing age, the heart muscle is able to pump blood as well as that in the young, but it is not able to relax as quickly, so the heart chamber is not able to fill as efficiently.

Contrary to what was previously thought, oxygen and energy are required more for relaxation than for contraction, so the development of relaxation abnormalities often precedes that of contraction abnormalities.

Why do muscle relaxation abnormalities develop in old age? As a result of a number of changes both outside of the heart muscle cell and inside the heart muscle cell, including the usage of calcium and changes in proteins, it causes the heart muscle to take longer to relax, and it serves to make the heart more vulnerable to stress.

The good news is that fortunately, it is at least possible to partly reverse most of these age-related changes with exercise conditioning. For those who are not able to exercise regularly, there are also drugs that may be helpful as well.

In the elderly woman, compensatory blood pressure and heart rate response mechanisms are often delayed or insufficient. This is why fainting is very common in older women during normal, daily activities such as arising from the bed, eating a meal, or going to the toilet. This is also why modest decrease of fluid, such as occurs during heat prostration, diarrhea, or decreased oral fluid intake can also result in large drops in blood pressure and cause falls or fainting in the elderly.

Older women lose balance and fall more frequently than older men. Women who fall are seven times more likely to sustain a hip fracture than older men who fall. Hip fracture is the most common diagnosis among all injuries that lead to hospitalization of elderly women. Ninety percent of all hip fractures occur in persons over the age of 65, and 80 percent of all hip fractures occur in older women.

Hip fractures are associated with a prolonged hospitalization, a high mortality, and a very substantial likelihood—one chance out of four—of permanent institutionalization in a nursing home.

A number of risk factors contribute to falling in addition to gender and age and cardiovascular disease. These include muscle weakness, use of psychoactive drugs, and overmedication.

Muscle strength training, it has been shown, even in frail, 90 year-old women and men, can result in greater mobility and improved balance as well as gait.

My colleagues are conducting a number of studies on osteoporosis and hip fractures. They have found that hip fractures in the elderly are more a function of the mechanics of the fall—that is, the direction of the fall. For instance, if you fall forward or backward, you have a lesser chance of sustaining a hip fracture than if you fall to the side—and unfortunately, most older women fall to the side. In addition, another important factor that contributes to the development of hip fracture is the amount of soft tissue that exists over the hip.

Recently, our faculty developed a hip padding system that can be worn as an undergarment to protect the hip from fracture in those elderly patients who are predisposed to fracture. They are also investigating ways to reduce resorption of bone at the cellular level by designing new types of molecules that would decrease the binding to bone by the cells that cellularize and resorb bone matrix.

Urinary incontinence is another common problem in older women and also in older men. Our faculty have found that most cases of

incontinence could be treated inexpensively and effectively, thereby allowing the older person to regain functional independence.

Our faculty is also deeply involved in research on the molecular biology and genetics of aging. They have found that DNA repair in cells of patients with Alzheimer's disease is effective in comparison to those age-matched normal persons. The capacity to repair DNA may be correlated with longevity.

Ongoing breast cancer research and uterine tumor research include efforts to identify genes involved in tumor suppression and cell senescence.

The recent development of a genetically-engineered mouse strain will for the first time allow us to test the hypothesis that aging occurs partly as a result of the accumulation of DNA mutation in cells.

Where should we as a nation focus our research efforts in the future? There are immediate and long range needs that should be addressed. Our immediate needs include, first, further research on the clinical conditions that disable elderly men and women, as well as the testing of their corresponding therapies. Two, we need to invest in the infrastructure of caring for older people by training more personnel to care for them, including geriatricians. Three, we need to avoid the dehumanizing effect of warehousing of chronically disabled elderly by designing and building better assisted living facilities. And we need to enhance their functional independence and mobility through the development of improved assistive devices.

Four, we need to prevent morbidity through improved physiological monitoring and early detection of dysfunction. Five, we especially need to delay the onset of cognitive impairment through early detection, retraining, and preventive therapies.

Our long range goals should be to decrease health care costs, not by limiting expenditure, but by developing less expensive and more effective therapies. One, we need to unravel the multifaceted process of aging by analyzing it in terms of molecular processes that interact with environmental factors.

We need to understand how genes regulate aging and identify those genes that might collectively promote longevity, as well as identify those genes that cause age-related diseases.

We need to understand better how the brain works and how memory fails. We need to understand the plasticity of living systems, the repair and regenerative processes of our tissues, the differences between reversible and irreversible change in function, and we need to discover new ways to help our tissues repair themselves faster and more completely.

We need to understand the physiology of complex systems and use this information to forecast morbid events. As a long-term strategy, it is of the utmost importance to integrate basic research with clinical practice.

In conclusion, the goal of biomedical research in aging for the benefit of older women and men should be to preserve function, prevent illness, and maintain independent functioning in the community as long as possible, thereby expanding the span of healthful living and reducing the cost of health care.

Thank you. [Applause.]

The CHAIRMAN. Thank you, Doctor. That was very provocative.

My mother is 102 years young just this morning, and to see her still do her physical exercise at that age, and listening to your guidance on so many other issues, I can tell you just from personal experience that I can say "amen" to all that you recommend. I think you pose enormously interesting challenges for us to develop further insight, which will be very, very valuable for all of us.

Thank you.

The CHAIRMAN. Dr. Rosenberg.

Ms. ROSENBERG. Thank you, Senator Kennedy. Welcome to Boston, Dr. Healy.

I am very honored to have been asked to speak about hormone replacement therapy. First, I would like to briefly describe some of the work that our research group, the Slone Epidemiology Union here at the Medical School, is conducting on the health effects not only of estrogen supplements, but also of other drugs that women commonly use.

For 16 years, we have been engaged in a surveillance study of serious illnesses and drugs, which was begun by our director, Dr. Sam Shapiro. Based on data collected from over 70,000 patients, we have published extensively on the health effects of estrogen supplements, of oral contraceptives, and of other drugs that women use, as well as drugs that men use.

For example, for estrogen supplements, we have found, as have others, that their use increases the risk of cancer of the lining of the uterus, and that risk increases as the length of use increases, and that the increase persists even after stopping.

The study has generated many important hypotheses, among them that alcohol consumption might increase the risk of breast cancer. A recent hypothesis from the study that we are testing in another study is that aspirin use may reduce the incidence of large bowel cancer, which is a very common cancer among both women and men.

We have recently completed a study of the health effects of estrogens, which indicates that women using estrogens appear to have a reduced risk of heart attacks; that the reduction, however, disappears after use stops.

We are conducting another study to determine whether the new low-dose oral contraceptives increase the risk of heart attacks, as we and others found was the case for the old higher-dose oral contraceptive pills.

In another study, my colleague Dr. Julie Palmer is assessing causes of choriocarcinoma, a malignant disease of pregnancy for which few risk factors are known.

Another colleague, David Kaufman, is conducting a study to determine whether aspirin, in doses that are being used to prevent heart attacks, increases the risk of the user having an upper gastrointestinal bleed.

We are collaborating with a colleague here at the School of Public Health, Dr. Ted Colton, in two follow-up studies. One is to determine the long-term health effects of silicone gel breast implants, and the other is to determine the long-term health effects of exposure to diethylstilbestrol during pregnancy.

Another colleague, Dr. Allen Mitchell, has for many years been conducting a study to learn about causes of birth defects, and a very important recent finding from that study is that women who take folic acid supplements have a reduced risk of giving birth to a child with a serious defect of the brain and spinal cord.

Most of the current knowledge that we have about disease in women is based on data collected from white women, and there is a great need, as Dr. Healy and others have mentioned, for studies among black women and other minority groups. Under the direction of my colleague Dr. Palmer, we are using the surveillance study data for specific analyses of the health effects of drugs in black women. We are also trying to obtain funding for a follow-up study of black women which would be similar to studies that are currently in progress among white women. We haven't yet managed to receive funding, but I think if we were successful, this study would fill many of the gaps in our knowledge about causes of disease in black women.

What do we know now about the health effects of hormone supplements? Estrogen replacement therapy, or ERT, and hormone replacement therapy, or HRT—HRT being estrogens used together with a progestin—are now among the most commonly prescribed drug regimens in this country.

Originally, estrogens were used for a few months, or perhaps a few years, for the relief of symptoms of the menopause, but now, ERT and HRT are widely recommended for use for many years, perhaps even for the life of the woman, with the hope of preventing heart disease and fractures. The combination regimen of estrogen and progesterone was devised after it was discovered that estrogen alone causes cancer of the lining of the uterus. The hope is that by adding progesterone, women will be protected from that increased risk.

There are no data from randomized trials yet on the health effects of ERT or of the combination therapy. There have been many observational studies, however, which suggest that women who are currently using estrogen have a reduced risk of heart attacks; that the reduction is related to how long they have used the drug, with increasing protection the longer the use; but that after women stop using the drug, the protection goes away.

It happens to be the case that women who tend to use estrogens also are women who have a lower baseline risk of heart disease, and therefore, part of the apparent protective effect of estrogen therapy may be due to this bias, simply that healthier women use estrogens. And that is one very important reason why we need a randomized trial to answer this.

Estrogen replacement therapy reduces the risk of fractures, but as for heart disease, the protection seems to disappear a few years after stopping. Long-term estrogen use certainly increases the risk of cancer of the lining of the uterus, and it appears, although it is uncertain, that it may increase the risk of breast cancer.

Much less is known about the health effects of hormone replacement therapy, estrogen with progesterone. This combination therapy probably reduces the risk of fractures while the drug is being used. There are not data on the effect on heart disease risk of combination therapy, and the effect may well be unfavorable because

progesterone can reverse the beneficial effect that estrogen has on serum cholesterol.

There is some evidence on breast cancer risk, very little, but what little evidence we have on the effect of hormone replacement therapy I think is cause for great concern and suggests that it may increase the risk of breast cancer. The combination probably does not increase the risk of endometrial cancer, cancer of the lining of the uterus, but this is not definitively established yet.

There is a clear need for more knowledge about the long-term health effects of these drugs. We do know alternative ways to reduce the risk of heart disease and fractures. For example, women who participate in moderate physical exercise or who quit smoking have a reduced risk both of heart disease and of fractures.

However, we do not know how to reduce the risk of breast cancer. Despite these facts, and despite the gaps in our knowledge, millions of women, American women particularly, are being urged to use these drugs for the rest of their lives. In my view, these drugs are being prescribed without adequate assessment of the risks, benefits, and alternatives.

As far as future research is concerned, our surveillance study will continue to collect data to assess the long-term effects of estrogen therapy, hormone replacement therapy, and whatever new regimens are introduced, for as long as we can obtain funding. There will be a need for long-term observational studies for as long as these drugs are used, and I expect that we and other investigators will continue to write grant proposals to assess their effects and, of course, we will continue to respond to RFPs and RFAs that are issued by NIH.

Dr. Healy has introduced a new focus in the NIH, a focus on women's health, and this is very commendable and has been needed for a long time. As part of that focus, a randomized trial of estrogen and of hormone replacement therapy will be carried out within a larger trial called the Women's Health Initiative. That trial is also concerned with at least two other interventions.

I think a randomized trial is much needed, but I think it would have a greater chance of successful completion if the trial of estrogen and hormone replacement were conducted as a separate trial.

In the past, most of the research funded by NIH has been initiated by investigators. This has been very productive, and from what Dr. Healy said today, it seems that this will continue, and I applaud that. I think it has been very productive. I think that the best way for NIH to direct research is to select topics of importance such as the health effects of silicone breast implants or the health effects of diethylstilbestrol exposure and then to issue RFPs, or even preferably RFAs, for investigators to then devise research designs and for committees of their peers to judge which design is best. And certainly NIH needs more funding. Anyone who is an investigator knows that we have to spend an increasing proportion of our time writing grant proposals, trying to obtain support.

Finally, commendably, NIH has been devising a strategic plan to guide its research agenda over the next five or 10 years. I have seen some interim drafts; I haven't seen the final plan. In the past, there were three areas that NIH focused on: biologic research, clinical research, and epidemiology or population studies. In the draft

that I saw, which was an interim draft, NIH seemed to be emphasizing biologic research and clinical research, but deemphasizing epidemiology.

Some of our greatest public health advances have come from epidemiologic research, and I think they will continue to come from this discipline, so I would urge that NIH continue to emphasize epidemiologic studies.

I would like to end by seconding what my colleague, Dr. Ockene, said about preventive efforts. I think that NIH has been putting more effort into preventive efforts and even more would be a good thing—efforts such as smoking prevention programs, intervention programs to promote moderate exercise, programs to promote healthier diets, and programs for the prevention of the transmission of the AIDS virus.

Thank you very much. [Applause.]

The CHAIRMAN. Thank you very much.

[The prepared statement of Ms. Rosenberg appears in the appendix.]

The CHAIRMAN. Dr. Rosenberg, you mentioned the difference between the cause and prevention of disease is based on data collected primarily from white women in many of these areas. The death rate from coronary heart disease is higher for black women than white women, and the incidence of breast cancer is lower for black women, but the death rate is higher; and black women have less problem with osteoporosis than white women.

So do women of color respond differently than white women to estrogen replacement therapy?

Ms. ROSENBERG. No one knows. And black women are much less likely to be prescribed estrogen than white women are. Part of the reason is that black women are much less integrated into the medical care system. In this instance, I think it might be a benefit, because some practitioners are now beginning to think of menopause as a deficiency disease, so it is being defined as a disease state which must be treated by estrogen. And I don't think that this is so much the case for black women. But the health effects of estrogens in black women have not been studied.

The CHAIRMAN. Women have been sort of left out of the trials and the research. Since we have these kinds of results in terms of blacks and whites in certain diseases, are you going to be looking at clinical trials that may be done just with black women and just with white women?

Ms. ROSENBERG. I think that's very possible, or what Dr. Healy has been urging is that they be included in large enough numbers in the current trials so that one could get stable results within that group. Perhaps an alternative is to conduct separate trials. But as you say, black women get less osteoporosis than white women. Part of that might be genetic, but part of it might also be related to the fact that they tend to be more obese, and there are other lifestyle differences that might be involved here.

The CHAIRMAN. Until recently, we have not focused on the different chemical and biological differences between men and women. But I guess in some areas, we probably have to be sensitive to the disparities that exist in terms of color and ethnicity. We understand we have to be sensitive to this as well.

Ms. ROSENBERG. Yes.

The CHAIRMAN. Your study found that women who take estrogen therapy have an increased risk of developing cancer of the uterus. Do the risks of estrogen therapy outweigh the benefits?

Ms. ROSENBERG. It depends how you do these calculations. I have never done a risk-benefit calculation. I think they are very suspect because we don't really know what the true reduction is in the risk of heart disease and to weigh that against the increased risk of endometrial cancer.

Another thing that comes into play here is that these diseases happen at different ages, so that the reduction in the risk of heart disease might be most important at much older ages, whereas women get breast cancer at younger ages. So when the risks and benefits are described to them, I think they are very rarely told about the fact that certain diseases occur at different ages.

The CHAIRMAN. I imagine we will have to pursue this area as well.

Dr. Wei, is there anything more that we should know in terms of the dietary condition of older persons—vitamins, food supplements such as calcium which prolong life, improve health, and counter the effects of aging?

Dr. WEI. That's an excellent question, Senator Kennedy, and is a topic of immense interest, probably even more out in the community than it is in the research community. But certainly it is an area that warrants much investigation, and there are possibly—for instance, some of the vitamins, and some of the anti-oxidant agents, that may perhaps have a role in terms of preventing oxidative or peroxidative damage to membranes in cells and also that damage mitochondria. And mitochondria, as you know, are the powerhouses for each of our cells, and if we can keep them working as well as possible, then we can be more assured that we will have an excellent energy supply that allows us to keep going and our cells to keep going.

So I think investigations along those lines will be very beneficial.

The CHAIRMAN. Dr. Ockene, I'm sure you are familiar with the provisions of the NIMH bill last year which requires States to develop their own procedures to restrict or prohibit the availability of cigarettes to young people under the age of 18, and that if they fail to do so, they reduce their ability to obtain certain kinds of Federal funds. We are going to watch what the States do in this area. Fighting the tobacco lobby is difficult. We make incremental progress in terms of the tobacco industry, and this was a small measure but one in which I am a very, very strong supporter. Your testimony indicates we still have far to go and I hope we can count on you to help as well.

Ms. OCKENE. Yes, and I'd like to just comment on that. I think that that was extremely important, and I think we are learning more and more that policies have a tremendous effect on behaviors of individuals. And that is one area that we can all be much more active in.

For example, I am very pleased to say that Massachusetts just passed an increased excise tax for cigarettes, and I think that this is something that we've seen demonstrated does have a tremendous

effect on the buying power of individuals, especially young individuals, and therefore does have an effect on the rates of smoking.

So I think that we need to make sure we integrate policies and direct interventions on individuals to really have an impact.

The CHAIRMAN. Years ago, I had an amendment on higher taxes for high tar and nicotine. Senator Hart and I sponsored that, 18 years ago. So we keep coming back to it, and we'll do what we can.

Ms. OCKENE. So you were ahead of the time.

The CHAIRMAN. Well, people have been after this, and Greg Connolly has been after it just in regard to foreign policy. The idea that these tobacco companies can advertise, for example, in the inner cities the way they do, and Boston can't control it because it was preempted in terms of national legislation 30 years ago is absolutely unconscionable.

Well, we won't get into all of these other things, and I want to thank the panel. It has been enormously interesting, and I think it is exciting, and it is important that those in other parts of the country understand what is happening here and that we understand what is happening in other areas.

We thank the panel very, very much. [Applause.]

The CHAIRMAN. We'd now like to hear from Drs. Amaro and Laffel. Treatment of women's addictive disorders is uncharted territory. Women appear to become addicted more rapidly than men and have stronger psychological dependency.

The infant mortality is three to eight times higher in diabetic mothers than nondiabetic mothers, and congenital abnormalities in children of diabetic mothers is more common than in children of nondiabetic mothers.

Dr. Hortensia Amaro is an associate professor of social and behavioral sciences at Boston University. Dr. Amaro will discuss substance abuse in women. And Dr. Laffel is a senior physician investigator at Jocelyn Diabetes Center, and she will discuss diabetes in women.

We want to thank all of you very much. You have all been extremely kind. And I want to thank Dr. Healy as well. We rarely find in this business that someone who heads an agency remains to hear the testimony of those who follow. [Applause.] I think it is a real tribute to her strong commitment that she has remained with us.

Dr. Amaro.

STATEMENTS OF HORTENSIA AMARO, ASSOCIATE PROFESSOR OF SOCIAL AND BEHAVIORAL SCIENCES, BOSTON UNIVERSITY SCHOOL OF PUBLIC HEALTH; AND DR. LORI LAFFEL, SENIOR PHYSICIAN INVESTIGATOR, JOSLIN DIABETES CENTER

Ms. AMARO. Good morning, Senator, Dr. Healy and Dr. Dunn. My name is Dr. Hortensia Amaro, and I am an associate professor of social and behavioral sciences at Boston University School of public health. I am pleased to be here today to discuss research on women's health.

I am going to focus my comments on two areas to which I have devoted most of my career—women's substance use and Hispanic women's health.

My written testimony which I submit for the record provides more details on the issues I am going to discuss in my presentation.

First, I would like to highlight some of the things we have learned in the course of implementing a three-year, NIDA-funded, community-based HIV prevention program with over 550 pregnant women drug users, and more recently, with implementing a five-year CSAP-funded early intervention program for over 700 pregnant women drug users.

Both of these demonstration projects are unique in that they stress the importance of street outreach to reach and identify women at risk. This involves going to where women who are addicted live, be it in public housing or welfare hotels, going to where women buy drugs and where women engage in prostitution in order to engage them in the project.

The Moms Project also stresses the critical role of women who are themselves in recovery as the staff that can most successfully engage women in the treatment process.

As a result of these approaches, we are able to reach women that others cannot reach.

The first observation is that it is important to note that in the last 4 years, we have seen significant improvements in the availability of drug treatment for pregnant women, specifically in Massachusetts. Four years ago, we could hardly find a detoxification center, a shelter, or residential treatment program that could accept pregnant women and their children. Today there are over 30 beds in detoxification centers and 42 beds in residential treatment programs specifically targeted for pregnant women and their children. There are also now shelters specifically targeted for women and their children in this State.

This change was brought about by the Federal initiatives for funding for such programs and also by the CSAP-funded Massachusetts Coalition on Addiction, Parenting and Pregnancy, which brings together providers from a broad range of areas together to improve women's access to treatment.

A second observation from our experience is that there continues to be a great unmet need in substance abuse treatment for women. Out of 550 women engaged in our NIDA-funded program, 89 percent were actively addicted to illicit drugs, but only 19 percent were in any type of treatment program.

Since the majority of women in our study were addicted to crack, about 70 percent, and to cocaine, about 60 percent, available methadone treatment programs were not useful to them. We also found that many women could not benefit from existing outpatient treatment programs. Over half of the women we work with are homeless or lack stable housing, and many women are living in other people's apartments, in situations that are not conducive to recovery. As such, outpatient programs are not well-matched to the needs of many addicted women because housing is a primary problem that remains unaddressed by outpatient programs.

For some groups of women, appropriate treatment is impossible to find. For example, there are virtually no programs that can appropriately serve women diagnosed with mental illness as well as

addiction; second, adolescent girls who are addicted, and third, Hispanic women.

Detoxification and residential treatment programs that are culturally and linguistically appropriate for Hispanic women do not exist in Boston. Some outpatient treatment programs exist for Hispanic women, but they are limited in scope and in the number of clients that they serve.

In summary, our observations point to the need for substance abuse treatment services that meet the needs of women who are addicted to alcohol, to crack, to cocaine; programs for women who are homeless and in transitional housing; programs for adolescent girls and programs for Hispanic women.

Further, the lack of sources to pay for child care and child treatment continues to be a major barrier to treatment for women. Funds need to be specifically allocated for child care and child treatment, for residential and outpatient substance abuse treatment.

Next, I would like to highlight some of the most pressing research needs related to women's substance use and to put forth some recommendations to address these gaps.

First, the national studies that document substance use must be revised to improve the knowledge base on women's drug use. The samples in these studies must be expanded to include the homeless, out-of-school youth, and ethnic minority subgroups in sufficient numbers so as to allow indepth analysis of substance use among women in these populations.

Further, analysis of data from the National Household Study, the High School Seniors Survey, and the Drug Abuse Warning Network should systematically explore and report gender-specific patterns in drug use. Attention to gender-specific patterns has been lacking in past reports of these data. For example, the last report from the Drug Abuse Warning Network failed to note the greater increase in cocaine-related emergency room admissions among women compared to men and the striking increase of overall emergency drug-related consequences for women compared to men.

Failure to note such important gender-specific trends in substance use contributes to the lack of research and public policy attention on women and substance use.

A second recommendation is that the Center for Substance Abuse Prevention and the National Institute on Drug Abuse should prioritize research on gender-specific factors associated with initiation and progression of substance use in girls and women. Related to this is a recommendation that the National Institute on Drug Abuse prioritize the development and evaluation of prevention programs designed to address gender-specific issues.

The majority of prevention programs do not employ gender-specific approaches to prevention, and there is little information on the relative effectiveness of these programs with girls. Yet we know from previous research that women and men are introduced to drug use in different ways and that factors that influence their progression in drug use also differ in some important ways.

For example, in contrast to boys and young men, whose participation in drug use is typically through a male friendship, for adolescent girls as well as for adult women, introduction to drug use

and escalation of drug use often occurs in the context of a love or sexual relationship. Girls are especially vulnerable to the influence of male partners due to socialization which emphasizes the importance of retaining relationships.

In studies at Boston City Hospital, my colleague Barry Zuckerman and I have found that adolescent girls who have male partners who use drugs are two to three times at greater risk for using drugs themselves.

Programs that take into account gender-specific issues related to prevention of substance use need to be developed and empirically tested with different age and ethnic groups.

The fourth recommendation is that the National Institute on Drug Abuse and the Center for Substance Abuse Treatment support the development and evaluation of various treatment approaches for women, including women-centered approaches. Special attention should be given to the development of women-centered models that are appropriate for women of diverse ethnic, racial, and cultural groups.

The ADAMHA Reorganization Act provides for 15 percent of research budgets in NIAAA, NIDA and NIMH to be devoted to services research. I would suggest that some of these funds be directed to test the impact of various models of treatment on improved access and outcomes for women of varying ethnic and racial groups.

And finally, research is needed on effective methods of HIV risk reduction among women who use injection drugs as well as crack and cocaine, because the use of crack and cocaine is associated with exchanging sex for drugs, and can therefore place women at risk for infection.

The one major breakthrough that is needed if we are going to be more effective in helping women to reduce risk of HIV infection is the development of a female-controlled barrier method—and I am not speaking of the female condom, which I think won't be used by a lot of women at risk. Rather, I think what we need is basic science research that will facilitate the development of an effective and safe feracide.

Finally, I'd like to bring your attention to two issues related to improving data on the health status of Hispanic women. In the last few years, we have witnessed an unprecedented recognition of the need to improve the State of knowledge on women's health issues and on the health of minority populations, and I applaud the NIH and the National Center for Health Statistics for their recent efforts to make research and data more relevant to the needs of the American public.

Given the vital importance of the Women's Health Initiative and the Disadvantaged Minority Health Improvement Act, I would like to bring your attention to some problems that have thwarted the initial intent of these initiatives.

The sampling design for the Women's Health Initiative will result in 80 percent of the study sample being white women and 20 percent being nonwhite women. This categorization of ethnic minority women presents a serious problem, in my opinion, since they represent very diverse and heterogeneous populations with distinct health problems. Grouping these populations cannot be justified from a scientific or a practical perspective.

But even if data for the groups are disaggregated and reported separately, the sample size for each ethnic group and for subgroups within those ethnic groups will be too small to provide the much-needed information on the health problems women in Asian, black, Hispanic, and Native American communities. The sample sizes of women in these communities must be sufficiently increased in order to yield valuable information on these populations, and I would concur with Commissioner Kurland's suggestion that health agencies with a tradition of serving communities of color be made partners in these efforts through the Women's Health Initiative.

Finally, the Disadvantaged Minority Health Improvement Act of 1990 introduced in the Senate by you, Senator, was a very important step in addressing the dearth of information on the health status of minorities. This Act has important implications for improving the health data on Hispanics, who will be the largest minority group by the year 2000, and also the Asians, who are the fastest growing minority group.

However, the Act has not been as effective as originally intended, for two reasons. First, the low level of funding approved compared to what was originally appropriated hampered the effectiveness of the Act. For example, in the appropriation last year, while \$10 million was authorized, only approximately \$1 million was appropriated. In the reauthorization act scheduled to take place early this year, every effort should be made to achieve full approval.

In addition, I would suggest that new language be added to the bill to encourage the study of minority women's health.

And the second issue with the Disadvantaged Minority Health Improvement Act is that unfortunately, the National Center for Health Statistics did not guide the distribution of funds according to the report language that suggested the money be used for funding the development of research infrastructures, and as a result, the initial intent to develop research infrastructure in minority communities was thwarted.

Thank you, Senator, for this opportunity to address these issues.

The CHAIRMAN. Thank you. [Applause.] Perhaps you could send us a note on that last point, about how that was distorted, and also the recommendations on how to deal with it.

Ms. AMARO. OK.

The CHAIRMAN. I think we could probably do it without even a legislative change, but I'd be interested if you could do that independently.

Ms. AMARO. I would be happy to do that. And related to that, I would suggest that perhaps in the reauthorization, you might want to consider language that specifically guides them to target some of these moneys for research on minority women's health.

The CHAIRMAN. Good.

[The prepared statement of Ms. Amaro appears in the appendix.]

The CHAIRMAN. Dr. Laffel, thank you for being here.

Dr. LAFFEL. Good afternoon, now, Senator Kennedy, Dr. Healy and guests.

I'd like to thank you, Senator Kennedy, for inviting me to this hearing. My name is Dr. Lori Laffel. I am a senior physician and investigator at the Joslin Diabetes Center, the Nation's largest and oldest institution dedicated solely to diabetes research and patient

care. I have come today to talk to you about the health challenges posed to women by an unseen, frequently forgotten, yet potentially lethal illness, namely, diabetes.

First, I am going to outline the scope of the problems posed by diabetes. Next, I will briefly review recent successes and current initiatives. And finally, I will briefly outline future directions to manage this challenge posed by diabetes.

Diabetes is the prototype chronic disease of women. Diabetes and its debilitating complications strike women throughout their lives, as infants, young children, teenagers, wives, child bearers, mothers, and as grandmothers.

Diabetes accelerates the aging process and often shortens life. Few people realize what a devastating disease diabetes still is 70 years after the introduction of lifesaving insulin. And now for the grim statistics.

More than 7 million American women have diabetes. The prevalence of diabetes is increasing 6 percent per year. Diabetes kills or contributes to the deaths of 150,000 people each year, slightly more than half of whom are women. In a single year, diabetes kills as many people as have died during the entire history of the AIDS epidemic.

The annual price tag to the American public for diabetes is over \$30 billion in medical services and lost productivity. A major piece of that cost is paid by the taxpayer, through Medicare, Medicaid and other programs.

Diabetes can cause a host of devastating complications affecting women, their offspring and their families. First, diabetes is a leading risk factor for heart disease. By age 55, half of the people who were diagnosed with diabetes as children or young adults have heart disease, and one out of three of those people has died because of heart disease.

Diabetes is the great equalizer for heart disease in women. While in the general population, men are four times more likely to develop premature heart disease as women, the risk of developing heart and cardiovascular disease is the same for a woman with diabetes as it is for a man with diabetes.

Diabetes is the leading cause of new blindness in adults. Diabetes is the leading cause of kidney failure requiring dialysis or a kidney transplant. And people with diabetes are 50 times more prone to gangrene, which can lead to the loss of a limb.

Now, despite these grim statistics, the story of women and diabetes is in many ways an uplifting one. The United States is the international leader in biomedical research and in diabetes research in particular. With Federal assistance, our Nation's universities and research institutions have built the facilities, assembled the equipment and attracted outstanding investigators from many disciplines of science to focus on diabetes. Biochemists and molecular biologists are unraveling the fundamental causes of diabetes and its complications. Geneticists are now mapping the genetic defects of diabetes and are learning how to correct them.

The Joslin Diabetes Center in particular has a number of major research projects underway, thanks to major funding from the NIH. For example, Dr. Ron Kahn, who is Joslin's research director, and his team are focusing on the structure of the insulin receptor,

those sites on the cell wall specifically designed to recognize insulin and allow cells to absorb glucose from the bloodstream.

Dr. Gordon Weir and his associates are clarifying the pathways and metabolisms that cause insulin secretion, and they are examining the death and regeneration of the insulin-producing pancreatic beta cells, in the hopes of improving the possibility of eyelet cell transplantation.

Dr. George King is undertaking a major cell biology initiative in the study of diabetic retinopathy, which causes blindness in thousands of people each year. Dr. King's team is also investigating the molecular mechanisms by which high concentrations of sugar in the bloodstream cause vascular disease in people with diabetes.

And one last example. Dr. Angi Kolesky and I are investigating the role of hypertension, diet, blood sugar control, and genetic factors on the occurrence of kidney disease in insulin-dependent diabetes.

The NIH support has been crucial as well in Joslin's history of improving diabetes care. As I mentioned before, the story of women and diabetes is in many ways an uplifting one that actually began in the 1920s, when a female physician named Dr. Priscilla White first joined the Joslin practice.

At that time, the survival rate for women with diabetes who opted to have children was only 50 percent. In the 1930s, while the maternal survival had improved, half of the babies born to mothers with diabetes still died. Gradually, Dr. White discovered techniques to help both mothers and their babies to live. Today, 70 years of improvement in diabetes care and neonatal technology, we can now say that the survival rate for pregnancies complicated by maternal diabetes is at 96 percent, near that of the nondiabetic woman.

However, there are many problems still remaining. We need to ensure that there is proper prenatal care for these women with diabetes, and we need to identify ways to prevent the birth defects that are occurring in their offspring, defects that occur at a rate two to threefold greater than that in the nondiabetic population.

A great deal of research is also needed to help women with diabetes overcome the complications of their disease, to allow these women to survive to see their children grow to adulthood and to enable these women to enjoy their grandchildren.

Unfortunately, we know very little about how pregnancy affects the complications in women with diabetes. For example, up until a few years ago, women with diabetes and kidney disease were discouraged from having children because of the risk to the fetus and the fears of how pregnancy would accelerate their kidney disease. Today at Joslin, we have helped hundreds of women with kidney disease and diabetes navigate these previously uncharted waters and have successful pregnancies.

So we figured out how to lower the risk to the fetus, but now we have to learn how to better treat, manage and prevent these complications like kidney disease and heart disease in the mothers so that these mothers can live to nurture their children and their grandchildren.

Again, heart disease in women with diabetes is a major area requiring a great deal of additional research. What is it about this disease that makes a woman just as likely as a man to develop

heart disease, while nondiabetic women are far less likely than their male counterparts to develop these complications of the heart and blood vessels?

Also, blindness and visual disabilities are also among the most devastating complications of diabetes. Joslin's Dr. Lloyd Ayello pioneered the use of scatter laser photocoagulation in order to halt the debilitating cell death that leads to diabetic retinopathy and blindness. Although today we can prevent 95 percent of total blindness in patients who receive the appropriate medical care, we are still faced with severe visual disabilities that will occur in those not getting appropriate care and in those 5 percent who require newer techniques for earlier detection and better treatment.

And now, what about the children of these diabetic women? Research and statistics tell us that these youngsters are ten times more likely to develop diabetes themselves than the children of nondiabetics. Recent investigations at Joslin have shown us that we can lower the risk of the diabetic woman's child developing diabetes if the mother postpones having children until she is 25 years old or older. Now, why this happens, we don't know. But even with this knowledge, we know that more women with diabetes will be having children.

As a result, each future generation will have successively more people with diabetes than the previous generation unless and until research enables us to find ways of preventing the disease.

Today, research at Joslin has enabled us to identify relatives of a patient with diabetes who are at high risk for developing diabetes themselves, but now we need research that will enable us to prevent that process from occurring.

We at Joslin have a preschool clinic to help children who develop diabetes and their families cope with a very demanding disease that makes a parent constantly mindful of what and when a child eats, how much a child exercises, when was her last dose of insulin, and how high or low her blood sugar was an hour ago.

The psychological pressures of this disease are immense, and with many women growing up in single-parent households with single mothers these days, the demands can be even more challenging.

In summary, the global aspects of women's medicine are most clearly apparent in diabetes. To meet the growing challenge of this chronic disease and to provide for the well-being of women through the different phases of their lives, we need to increase funding for research to do the following.

We need to identify the causes and find ways to prevent or minimize complications in women, particularly involving the heart and the kidneys.

We need to address the threat of blindness. With the growing prevalence of diabetes, it is crucial that increased resources be directed to diabetic eye research. An important component of the NIH reauthorization bill this year, Section 455(a), which was introduced by you, Senator Kennedy, will fund three national centers for clinical research on diabetes eye care under the National Eye Institute.

We also need to prevent birth defects in the offspring of these diabetic women.

Most importantly, we need to identify modes of health care delivery that are most effective in helping people with a chronic disease like diabetes and their families cope with the physical and psychological challenges posed by this disease.

And finally, we need to identify the genetic and environmental factors that cause diabetes so that we can prevent it.

All these issues that I have just discussed need to be studied in Caucasians and in minority populations because the factors involved in the development of diabetes, the genetic factors and the environmental factors, may be very specific.

Our goals must ultimately be to help women with diabetes live long enough and complication-free enough to pursue a career, raise their children, and enjoy their grandchildren. And we must find the means to prevent this disease and its complications once and for all.

Thank you very much. [Applause.]

The CHAIRMAN. Thank you very much.

I have just a couple of questions. Dr. Amaro, I have been interested in the results of acupuncture treatment for people with addictions. Has there been some study of that, and could you give us any of the results on that?

Ms. AMARO. There really continues to be a lack of research in that area, but I think what makes research in that area important is that there are a lot of drug treatment facilities that are using acupuncture as an adjunct to counseling or other types of either inpatient or outpatient treatment. And there are some findings from studies at Lincoln Hospital in New York that suggest that acupuncture may be beneficial in reducing the effects of symptoms of detoxification, withdrawal and craving. But there really need to be more controlled studies.

The CHAIRMAN. OK. Dr. Laffel, I guess the prevalence of diabetes is increasing by 6 percent per year. Obviously, the programs need to be targeted both at the prevention of the disease and helping diabetic women cope with the disease and its effects on child birth and other complications.

How do you balance the areas of prevention and research? Obviously, we want to do both, but can you give us some insight from your own experience as to prioritizing?

Dr. LAFFEL. That's a very important point. First, of the 7 million American women with diabetes, many of them are undiagnosed at this time. So part of the issue is not only in treating the disease, but it is also recognizing those afflicted with the condition right now so that the second level of prevention, that is, preventing the complications, these devastating complications that occur with the disease, can be mitigated.

Now, similar to a lot of the discussion earlier today, risk factor reduction is probably appropriate in the area of diabetes in terms of environmental factors that are associated with the occurrence of the disease, such as obesity, lack of physical exercise, and so forth. So part of the Women's Health Initiative, more of a multiple risk factor intervention program aimed at women, is appropriate.

The CHAIRMAN. Do we know enough about how insulin is administered to understand its impact on creating congenital abnormalities in infants and infant mortality?

Dr. LAFFEL. That's a very good question. I think the issue of the birth defects associated with diabetes are being studied and need to be studied further. There is a clear association with uncontrolled diabetes, and you could use that as a surrogate for not getting enough insulin—not that insulin is giving you the birth defects, but not getting enough insulin is associated with an increased risk of birth defects.

On the other hands, there is also some suggestion that severe recurrent hypoglycemia, the other end of the spectrum, possibly too much insulin, or not careful attention to the balance between insulin and food and exercise, that may also be associated with birth defects.

The CHAIRMAN. OK. I want to thank the panel and all of you for joining us.

First of all, I think the hearing today indicated certainly to me and to our colleagues the extraordinary level of very important and sophisticated research that is taking place in our State on women's health issues. I think we have had some really extraordinary witnesses this morning who have spent a great deal of their lives, long before this issue really evolved and developed devoted to women's health. I think their research, and involvement in this area will be enormously valuable to us as a society and as a country as we find our way in the future. Clearly the kind of research that is being done on this issue by many in our State is really topflight.

Dr. Healy has taken steps, which she has outlined, on the health status of women. On January 21, I will reintroducing the NIH Reauthorization Act, and as I indicated, I expect that will probably be the first piece of legislation that will pass in this Congress. We will do everything we can to make sure this happens. It will ensure that women, statutorially will participate in the clinical trials and ensure equity in the allocation of funds for women's health research. It will be an item that we'll follow carefully, and we will need to have others within the areas of women's health research continue to interact with us so that we can monitor it very closely.

We will take back to the Congress the testimony that we have had today. I'm sure Dr. Healy, having been through the hearing, understands the enormous potential of NIH, and having listened to this testimony, is also wondering how we are going to pay for all these unfunded opportunities with the kind of resources that are available. But we'll do everything we can to try to increase those resources.

The opportunities that exist today at the NIH in a wide range of different areas are so extraordinary that if we fail to respond, it is at our own risk. I am very hopeful that we'll have a new day and a new chance to do so, and I certainly will do everything I can to move us along in that direction.

I thank all of our witnesses again, and thank Boston University Medical Center and all of you for joining us today.

[The appendix follows.]

APPENDIX

PREPARED STATEMENT OF LYNN ROSENBERG

My name is Lynn Rosenberg. I am Assistant Director of the Slone Epidemiology Unit, an epidemiologic research group within Boston University School of Medicine, and Professor of Epidemiology in the B.U. School of Public Health. Much of my career has been devoted to the study of risk factors for diseases in women, particularly oral contraceptives and estrogen supplements. I am grateful to be here and for having been asked to speak about hormone replacement therapy.

First I would like to briefly describe some of the work of the Slone Epidemiology Unit that impacts upon women's health.

CURRENT WORK

For 16 years, we have been engaged in a Surveillance Study of Serious Illnesses and Drugs, initiated by the Director of our Unit, Dr. Samuel Shapiro. Based on data collected from over 70,000 patients in this study, we have published extensively on the health effects of estrogen supplements, oral contraceptives, and other drugs relevant to the health of women (and of men). For estrogen supplements, in particular, we have found that they increase the risk of endometrial cancer (cancer of the lining of the uterus); their influence on the risk of ovarian and breast cancer is unclear. The study has generated many important hypotheses, among them that alcohol consumption increases the risk of breast cancer. A recent hypothesis from the study, that the use of aspirin reduces the incidence of large bowel cancer, a common and serious cancer, is currently being assessed in a new study that we are conducting among Massachusetts women and men.

We have recently completed a study of the effect of estrogen supplements on the risk of heart attacks. Current estrogen users appeared to be at reduced risk, and the longer the duration of use, the greater was the reduction; women who had stopped taking estrogens were not at reduced risk.

We are currently conducting another study of heart attacks to determine whether the newer lower-dose oral contraceptives increase the risk, as we and others have previously shown was the effect of the old higher-dose pills.

In another study, my colleague, Dr. Julie Palmer, is assessing causes of choriocarcinoma, a malignant disease of pregnancy for which few risk factors are known.

My colleague, Dr. David Kaufman, is conducting a study to assess whether aspirin, in doses used to prevent heart attacks, increases the risk of major upper gastrointestinal bleeding both in women and men.

We are collaborating with our colleague from the School of Public Health, Dr. Ted Colton, in a study of mothers and daughters who were exposed to DES during the mother's pregnancy, and in a study of women who received silicone gel implants for breast augmentation.

My colleague, Dr. Allen Mitchell, has for many years been conducting a study to determine whether drugs or other exposures during pregnancy cause birth defects. This study, like the Surveillance Study in adults, has the capability of assessing a wide range of hypotheses, of generating new ones, and of monitoring the health effects of old and new drugs. Most recently, we have found that folic acid supplements reduce the risk of spina bifida, a serious birth defect of the brain and spinal cord.

Most of the current knowledge about the causation and prevention of disease in women is based on data collected from white women. There is a great need for studies among black women (and other minority groups). Under the direction of Dr. Palmer, we are using the Surveillance Study data for specific analyses of the health effects of drugs and other exposures in black women. We are also trying to obtain funding for a large follow-up study of black women, which would do much to fill the gaps in our knowledge about causes of disease in this understudied group.

WHAT DO WE KNOW ABOUT THE HEALTH EFFECTS OF HORMONE SUPPLEMENTS?

"Estrogen replacement therapy," ERT, and "hormone replacement therapy," HRT (estrogen together with a progestin), are now among the most commonly prescribed drug regimens in the US. Originally ERT was used on a short-term basis, perhaps a year or so, for the relief of menopausal symptoms. Now, ERT and HRT are being widely used for periods of many years as preventives of heart disease and fractures. The HRT regimen was devised after it was discovered that estrogen taken alone causes endometrial cancer—progestin is now added if the woman has a uterus to protect against that risk.

Observational studies suggest that current use of ERT reduces the risk of heart disease, that the reduction is related to the duration of use, and that protection dissipates after use is stopped. Women who tend to use estrogens have a lower baseline risk of heart disease than those who do not; therefore, at least part of the apparent protective effect of ERT may well be due to bias, but we do not now how much. ERT reduces bone loss and prevents fractures; the scanty evidence available suggests that protection dissipates after use stops—thus, several years after quitting a woman appears to be in much the same situation as if she had never used ERT. Long-term ERT use may increase the risk of breast cancer, but this is still uncertain. ERT use increases the risk of endometrial cancer, and the increase effect persists for many years after stopping use.

Less is known about the health effects of HRT. HRT probably reduces the risk of fractures while the drug is used, with loss of protection after stopping. There are virtually no data on the effect of HRT on heart disease risk, and the effect may well be unfavorable because progestins reverse the beneficial effect of estrogen on serum lipids. As for breast cancer, the little evidence available suggests that HRT may increase the risk. HRT probably does not increase the risk of endometrial cancer, but evidence is still sparse.

To sum up, ERT probably reduces the risk of heart disease and fractures while women are using the drug, and it increases the risk of endometrial cancer. HRT

probably reduces the risk of fractures, and it may not affect, or may even adversely affect, the risk of heart disease. Both ERT and HRT may increase the risk of breast cancer. There is a clear need for more knowledge about the long-term health effects of these drugs.

There are alternative ways to reduce the risk of heart disease and fractures—for example, by participating in moderate physical activity and quitting smoking. However, we do not know how to reduce the risk of breast cancer. Despite these facts and despite the gaps in our knowledge about long-term effects of ERT and HRT, millions of American women are being urged to use these drugs. In my view they are being prescribed without adequate assessment of the risks, benefits, and alternatives.

FUTURE RESEARCH

Our Surveillance Study will continue to collect data to assess the effects of ERT, of HRT, and of whatever new regimens are introduced, for as long as we can obtain funding. Long-term observational studies—follow-up studies and case-control studies—will be needed for as long as these drugs are used. I expect that we and other investigators will continue to write grant proposals to assess their effects, and to respond to specific RFPs and RFAs.

Dr. Realy has introduced a new focus in the NIH—women's health—which is commendable and much needed. As part of that focus, a randomized trial of ERT and HRT will be carried out, within a larger trial called the Women's Health Initiative. A randomized trial is much needed. In my view, however, to improve feasibility and the chance of successful completion, the trial of ERT and HRT should be a separate study.

In the past, most of the research funded by NIH has been investigator-initiated. This has been very productive, and I believe that NIH should continue to put most of its research funds into investigator-initiated research, as opposed to NIH-initiated research. I believe that the best way for NIH to direct research is to select topics of importance—such as the health effects of silicone implants or of DES exposure—and to assign funds for

those areas. However, it should be left to the investigators to devise the research designs, and left to committees of their peers to judge which designs are the best. NIH needs more funding--it has become increasingly difficult to obtain funding for worthy projects, and investigators are obliged to spend a greater and greater proportion of their time in trying to obtain support.

Finally, NIH has been devising a Strategic Plan to guide its research agenda over the next decade. This is commendable. I have not seen the final plan, but I have seen parts of interim drafts. I would like to urge that, along with biologic research and clinical research, NIH continue to emphasize epidemiologic research. Many of the great discoveries about the causation and prevention of disease, and many of our greatest public health advances, have come from epidemiologic research. Without any doubt they will continue to come from that discipline. I also urge that greater effort be put into preventive efforts, such as smoking prevention programs, intervention programs to promote moderate exercise, and programs to promote healthier diets.

PREPARED STATEMENT OF HORTENSIA AMARO

My name is Dr. Hortensia Amaro and I am an associate professor of Social and Behavioral Sciences at the Boston University School of Public Health. I am pleased to be here today to discuss research on women's health. I will focus my comments in two areas that I have spent most of my research career studying -- women's substance use and Hispanic women's health.

Substance Use Among Women: Service and Research Needs

Needed Services

For the last twelve years I have been conducting research on women's substance use starting in 1979 with a study of women's access to alcoholism treatment in California. In the last several years I have been testing the effectiveness of community-based models for intervention with pregnant women who are drug users. The program known in the community as the Mom's Project, was first developed as part of the National AIDS Demonstration

Research (NADR) projects funded by the National Institute on Drug Abuse. This model stresses street outreach and the role of individuals in recovery to reach drug users.

Through our work with over 550 addicted pregnant women in the NIDA funded project we observed a great gap between available drug treatment services, which traditionally have not conducted street outreach, and women who needed the services. For example, while 89% of women who we recruited were using illicit drugs, only 19% of these were engaged in a drug treatment program. We saw that women were not able to access available services without active advocacy and case management. In many cases we observed that the lack of coordination of drug treatment, prenatal care, social services and legal services hampered women's efforts to utilize services effectively. We also found that contrary to the national research and service focus on heroin use, the majority of women were using crack (70%) and cocaine (60%) compared to heroin (27%). As a result, the treatment approaches available for pregnant women which employ methadone were not relevant to the needs of most of the clients.

Findings from our NIDA intervention study with over 550 addicted pregnant women demonstrated that significant changes in sexual risk reduction can be achieved with this model. However, we were not satisfied with these findings since it was evident that in order to achieve longterm change in HIV risk reduction treatment of the addiction was essential. This led us to develop a more comprehensive approach which is now funded by the Center for Substance Abuse Prevention. The model provides case management and support services in order to enhance women's effective use of drug treatment, prenatal care, and social services. Clients are assisted in learning about addiction and improving positive coping strategies through individual counseling, education/support groups and parenting skills enhancement training. Over one-half of the addicted pregnant women we find through street outreach are homeless or live in

highly unstable housing conditions. For this reason, services that assist women with housing, transportation, babysitting, clothing, and food are integral to our model.

Over the last four years we have observed improvement in services for pregnant addicted women. For example five years ago there were no or few designated treatment beds for pregnant women in residential treatment facilities. It was difficult if not impossible to get pregnant women admitted to detox and most shelters would not accept pregnant addicted women. In Boston the number of designated treatment beds for pregnant and post partum women and their children has increased to 30 beds in inpatient detoxification centers and 42 beds in residential treatment programs. There are now four residential treatment programs in Boston that accept pregnant women and their children. This change is clearly a result of federal initiatives that provided a catalyst for change through state funding and direct funding of projects.

However, the problem is far from solved and we continue to witness important barriers to treatment for women regardless of their pregnancy status. First, there continues to be a need for additional residential treatment slots for women. There is the need for more diverse treatment approaches so that treatment modalities can be better matched to client characteristics and needs. For example, women with dual diagnosis of severe psychiatric disorders and addiction can not receive appropriate treatment in most residential drug treatment programs because programs are not equipped to handle the specific needs and problems of this population. Similarly, it is virtually impossible to find an appropriate referral for adolescent girls who need a residential program.

Second, there continues to be a lack of treatment services that address the cultural and linguistic needs of minority women. Residential treatment that is culturally and/or linguistically appropriate for Hispanic women does not currently exist in

Boston. We have found that programs that are targeted to Hispanics are exclusively for men. On the other hand, programs that are targeted to women do not have staff who speak Spanish and who can provide a culturally appropriate treatment context. I am sorry to say that this has not changed since the late 1970's when we found the same problem in a study of women's access to alcoholism treatment in California (Beckman and Amaro, 1987; Beckman and Kocel, 1982). This is especially of concern considering the high rates of cocaine use among Puerto Rican women (Amaro, Whitaker, Coffman and Heeren, 1990). The need for treatment programs targeted to Hispanic women is probably the most pressing need that remains unaddressed. Programs that serve women must build the capacity to treat Hispanic and other minority women.

Third, while we have been delighted to see the effects of the new federal priorities to address the needs of pregnant addicted women, we have grown concerned over an unintended but potential longterm side effect of these initiatives. If treatment access is contingent on pregnancy and/or on having children, we might be creating incentives for women to become pregnant in order to access these services. Clients have been quick to observe the inequity in this system and I am sorry to say that some women find that the only route to drug treatment is to become pregnant so that they can qualify for existing programs.

The answer is to remove barriers to drug abuse treatment for all women in need through the development of initiatives that make substance abuse treatment available to women regardless of their reproductive or pregnancy status.

Recommendations for Research on Substance Use Among Women

Current public policy and research demonstrates almost exclusive concern for the impact of drug use on fetuses and children while ignoring the basic questions pertaining to addiction in women.

Improve Data on Alcohol and Drug Use Among Women

Data on the prevalence and incidence of women's use of alcohol and drugs stem primarily from national studies of the general population. The major national studies, the National Household Survey and the High School Seniors Survey conducted by the National Institute on Drug Abuse provide a rich knowledge base on substance use among women and men. However, the sampling design employed in the national studies pose important limitations on what we know about women because they have traditionally excluded homeless populations, and out of school youth, and because they have not included a sufficiently large sample of ethnic subgroups. In addition, lack of attention to gender in how data are analyzed limit their usefulness. The lack of attention to gender in the national studies is exemplified in the recent report from the Drug Abuse Warning Network (DAWN), which samples hospital emergency rooms for drug-related medical consequences. The report showed an increase in cocaine and heroin-related emergency room visits (National Institute on Drug Abuse, 1991b). Although not reported in the Department of Health and Human Services (DHHS) press release of the data, there are important gender differences in the percent of increase found for cocaine use in this period. The figures indicate a 37% increase in cocaine use among women and a 29% increase in men. The overall increase in emergency room heroin-related admissions was 26%. However, women demonstrated an increase of 46% in emergency-room drug related consequences compared to a 16% increase for men. While overall men comprise a larger number of drug-related emergency room visits, the data indicated that drug-related emergency room visits are growing more rapidly for women than men. Unfortunately, the DHHS report ignored these gender differences. The lack of attention to gender, and specifically assessment of drug use trends among women has influenced how existing data are analyzed and reported. There is a need to systematically and consistently analyze all data by gender and to investigate factors associated with drug use by gender.

Systematic gender analysis of the NIDA Household Survey data, High School Seniors Survey data and DAWN data would cost little more and add significantly to what we know about trends in women's use of drugs.

Recommendation #1: The National Institute on Drug Abuse revise the design of the National Household Study and the National High School Seniors Survey in order to improve the knowledge base on women's drug use. Better estimates of alcohol and drug use among Hispanic women could be provided by oversampling Puerto Rican, Mexican Americans and Cuban Americans to evaluate the prevalence and patterns of drug use in these different Hispanic groups. Sampling could also be expanded to include homeless populations and adolescents who are not in school so as to allow the calculation of prevalence and incidence estimates of drug use among girls and women in these high risk groups. In depth, gender-specific analyses need to be conducted and reported on a systematic basis.

Prioritize Research on Gender-Specific Risk Factors

There is little information on the relative effectiveness of substance use prevention programs among girls as compared to boys. The majority of prevention programs do not employ gender specific approaches to prevention and may not assist girls in addressing their unique needs. Gender specific approaches may be necessary since it is well established that women's and men's introduction and progression in drug use differ in some important aspects. One critical gender difference is that male partners and male friends play a key role in introducing women to drugs and in girls' and women's subsequent progression into heavier drug use (Anglin, Hser, & McGothlin, 1987). In contrast to boys and young men whose introduction into drug use is typically through a male friendship, for adolescent girls as well as for adult women, introduction into drug use and escalation of drug use often occurs in the context of a love or sexual relationship. Girls are especially vulnerable to the influence of male partners

due to socialization which often emphasizes the importance of retaining relationships. This places girls at risk of placing higher priority on love relationships than on the risk associated with substance use (Mahyari, 1990). Girls who have male partners who use drugs are at greater risk of drug use themselves.

Compared to girls who do not use drugs, adolescent girls who use drugs during pregnancy for example, were found to be three times more likely to have male partners who use marijuana and cocaine (Amaro, Zuckerman & Cabral, 1989). The male partners of girls who use drugs in pregnancy were also heavier substance users than partners of girls who do not use drugs (Amaro, Zuckerman & Cabral, 1989).

The lack of scientific inquiry into the effectiveness of current prevention approaches among adolescent girls represents a glaring omission in the existing knowledge base. Research is needed to identify gender differences in the effectiveness of current prevention approaches targeted at children and adolescents. Programs which take into account gender-specific issues related to prevention of substance use need to be developed and empirically tested.

Recommendation #2: The Center for Substance Abuse Prevention and The National Institute on Drug Abuse add to its priority areas research on effective prevention programs targeted at women in all high risk groups regardless of age or pregnancy status. Prevention research and demonstration projects should stress the development and test of models which take into account gender specific orientations, as well as developmentally appropriate, and culturally appropriate approaches. Research on effective models for substance abuse prevention should seek to address the risk factors associated with substance use that are unique to women.

Recommendation #3: The National Institute on Drug Abuse support research to investigate the initiation of substance use among adolescent girls and the sex-specific factors associated with continued use and progression into other drugs and more

frequent use. While previous research has identified a risk profile among adolescent girls who use drugs, the causal relationship between substance use and other negative outcomes such as adolescent pregnancy, dropping out of school, sexually transmitted diseases, and other risk taking behaviors needs empirical investigation (Amaro and Zuckerman, 1991). The role of social relationships, especially with male partners, and the social context in which an adolescent girl lives also needs to be more clearly understood in light of socialization which orients girls to relationships with others.

Develop and Test Women-Centered and Culturally Appropriate Treatment Models

Most research on treatment of substance abuse continues to ignore not only gender but also gender-specific issues relevant to treatment (Vannicelli, 1984). While many studies now include women in their samples, analyses do not focus on assessing gender differences in effectiveness of treatment.

Past research has documented that women bring to treatment clinical issues (e.g., affective disorders, depression, low self-esteem, feelings of powerlessness, high denial, history of incest and abuse), which differ in type and/or intensity to those of men (Beckman, 1978; Beckman, 1980; Beckman & Amaro, 1984). It is also well known that based on women's social role, women bring to treatment special needs (e.g., need for childcare and child treatment, employment and skills training, assertiveness training, and reproductive health care), which also differ from those of men (Beckman and Amaro, 1984; Finnegan, 1979; Finkelstein, Duncan, Derman, Smeltz, 1990; Brown, 1991). While many providers agree that such factors need to be considered in the treatment of women, there is a lack of empirical data on the most effective models of treatment for women. The clear articulation of treatment models specifically designed for women and the empirical test of the effectiveness of these models for different populations of women and diverse drugs (e.g., cocaine,

heroin, alcohol), continues to be a research priority of major importance.

Recommendation #4: The National Institute on Drug Abuse and the Center for Substance Abuse Treatment support research on models of substance abuse treatment for women. Research is needed to compare the effectiveness of family oriented models of treatment with individual models of treatment for outpatient and inpatient programs. Similarly, the effectiveness of programs which stem from a gender-specific theoretical understanding of the process of addiction, should be compared to generic or "gender neutral" models of treatment. The development and evaluation of treatment models should pay special attention to the appropriateness of models for treatment of women of diverse ethnic/racial and cultural groups and of women addicted to different substances.

Language in the ADAMHA Reorganization Act provides for 15% of research budgets in NIAAA, NIDA, and NIMH to be devoted to services research. Some of these funds should be directed to test the impact of various models of treatment on improved access and outcomes for women.

Research on Hispanic Women's Health

In the last several years we have witnessed unprecedented recognition of the need to improve the state of knowledge on the health status of women and minorities. I applaud the NIH for taking the long overdue step of addressing women's health issues and the National Center for Health Statistics for their recent efforts to improve available health data on ethnic minority populations. Given the vital importance of these initiatives, I would like to bring your attention to some critical problems with these efforts.

The Women's Health Initiative

First, I would like to highlight two major problems with the Women's Health Initiative:

- (1) The sample size of Hispanics and other ethnic minorities severely limit the usefulness of information to be gained by the study. The sampling design for the Women's Health Initiative will result in 80% of the sample being white women and 20% of the sample being "non-white" women. This categorization and grouping of ethnic minority women presents serious problems since they represent very diverse and heterogeneous populations with distinct health problems. Grouping these populations can not be justified from a scientific or practical perspective. Even if the data for the groups are reported separately, the sample size for each group will be too small to provide much needed information about the health problems of women in Asian, Black, Hispanic and Native American communities. Ten years from now, after a very expensive and laborious undertaking, the Women's Health Initiative will provide little valuable data on the health problems of ethnic minority women. It is critical that these issues be rectified prior to the initiation of the clinical trials and natural history study.
- (2) Diabetes Mellitus, a primary health concern in Hispanic communities, is not identified as a primary area of study in the Women's Health Initiative. The incidence of diabetes among Mexican American and Puerto Rican women is approximately three to five times the rate found among non-Hispanic white women. The decision in the low-fat diet study to make breast and colon cancer a primary aim and diabetes a secondary study aim is an inappropriate prioritization of health concerns for the Hispanic community. This is especially true considering the lack of appropriate data from which to make observations about cancer incidence among Hispanics and the well documented

incidence of diabetes and the resulting consequences of undiagnosed diabetes including blindness, kidney failure, limb amputation and death among Hispanic women.

The Disadvantaged Minority Health Improvement Act

The Hispanic population in the United States is growing rapidly and by the year 2000, it will be the largest ethnic minority population in this nation. In spite of a major demographic shift toward racial/ethnic diversity in the U.S. population, current national data systems yield little information on the health status of Hispanics in general and specifically on the health of Hispanic women. The Disadvantaged Minority Health Improvement Act introduced by Senator Kennedy in the Senate was an important step in addressing the dearth of information on the health status of Hispanic groups and other minority populations. However, the Act has not been as effective as originally intended for two reasons:

- (1) The Disadvantaged Minority Health Improvement Act of 1990 was hampered from achieving its goal by the low level of funding that was approved compared to what was originally appropriated. In the appropriation for last year, while 10 million was authorized only approximately 1 million was appropriated. In the reauthorization of this act, scheduled to take place early this year, every effort should be made to achieve full approval for the appropriated amount. In addition, new language should be added to the bill to encourage the study of minority women's health.
- (2) The National Center for Health Statistics did not follow the recommendations of the report language to the Act, which indicated that the funds be used to support the development of research infrastructure within minority communities rather than to support one time awards through NCHS. The report language suggested that national minority groups such as the Hispanic Health Research Consortium and the Asian Health Forum be funded under this program.

In the last year, NCHS chose to disregard this language and instead funded individual awards thereby undermining the original intent to foster the development of research infrastructures in minority communities. In the previous year under funding from NCHS, The Hispanic Health Research Consortium initiated the development of a research infrastructure to support research on Hispanic women's health by funding five research teams and developing a network of researchers on Hispanic women's health. It is this type of effort which brings together a critical mass of researchers that results in meaningful improvement on the knowledge base on Hispanic women's health. However, continuation of this effort was thwarted by the NCHS decision to shift the focus from capacity building and development of research infrastructures to one time awards. Stronger language should be incorporated in the reauthorization in order to direct the funds to the development of research infrastructures in minority communities.

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The CHAIRMAN. The committee stands in recess.
[Whereupon, at 12:35 p.m., the committee was adjourned.]

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